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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	5925-061-999	*Total Pages*	121
First Named Inventor or Application Identifier			
Robert Zambias			
Express Mail Label No.	EM 202 006 602 US		

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☒ Fee Transmittal Form
   Submit an original, and a duplicate for fee processing)
2. ☒ Specification [*Total Pages* 117]
   (preferred arrangement set forth below)
   - -Descriptive title of the Invention
   - -Cross Reference to Related Applications
   - -Statement Regarding Fed sponsored R&D
   - -Reference to Microfiche Appendix
   - -Background of the Invention
   - -Brief Summary of the Invention
   - -Brief Description of the Drawings *(if filed)*
   - -Claim(s)
   - -Abstract of the Disclosure
3. ☒ Drawing(s) *(35 USC 113)* [*Total Sheets* 2]
4. ☒ Oath or Declaration [*Total Sheets* 2]
   - a. ☐ Newly executed (original or copy)
   - b. ☒ Copy from a prior application (37 CFR 1.63(d))
     (for continuation/divisional with Box 17 completed)
     [Note Box 5 below]
     - i. ☐ DELETION OF INVENTORS(S)
       Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33 (b).
5. ☒ Incorporation By Reference *(useable if Box 4b is checked)*
   The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
6. ☐ Microfiche Computer Program *(Appendix)*
7. ☐ Nucleotide and/or Amino Acid Sequence Submission
   (if applicable, all necessary)
   - a. ☐ Computer Readable Copy
   - b. ☐ Paper Copy (identical to computer copy)
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ACCOMPANYING APPLICATION PARTS

8. ☐ Assignment Papers (cover sheet & document(s))
9. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney
   (when there is an assignee)
10. ☐ English Translation Document *(if applicable)*
11. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
12. ☐ Preliminary Amendment
13. ☒ Return Receipt Postcard (MPEP 503)
    (Should be specifically itemized)
14. ☐ Small Entity ☐ Statement filed in prior application, Statement(s) Status still proper and desired
15. ☐ Certified Copy of Priority Document(s)
    (if foreign priority is claimed)
16. ☒ Other:
    - copy of Filing Receipt of US 08/375,838
    - copy of Decision According to Status Under 37 C.F.R. § 1.47(a) in US 08/375,838
    - copy of Petition Under 37 C.F.R. § 1.47(a) in US 08/375,838
    - copy of Declaration in Support of Filing on Behalf of Omitted Inventor Under 37 C.F.R. § 1.47(a) in US 08/375,838

17. **If a CONTINUING APPLICATION,** *check appropriate box and supply the requisite information:*
    ☒ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No: 08/375,838 filed 01/20/95.

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ATTORNEY DOCKET NO. 5925-061-999 Date January 20, 1998

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Box PATENT APPLICATION
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Sir:

The following utility patent application is enclosed for filing:

Applicant(s): Robert Zambias, David A. Bolten, Joseph C. Hogan, Paul Furth, David Casebier and Cheng Tu Executed on:

Title of Invention: LOGICALLY ORDERED ARRAYS OF COMPOUNDS AND METHODS OF MAKING AND USING THE SAME

Pages of Specification 117 Sheets of Drawings 2

PATENT APPLICATION FEE VALUE

TYPE	NO. FILED	LESS	EXTRA	EXTRA RATE	FEE
Total Claims	33	-20	13	$22.00 each	286.00
Independent	4	-3	1	$82.00 each	82.00
			Minimum Fee		790.00
			Multiple Dependency Fee If Applicable ($270.00)		270.00
			Total		1,428.00
			50% Reduction for Independent Inventor, Nonprofit Organization or Small Business Concern (a verified statement as to the applicant's status is attached)		-
				Total Filing Fee	$ 1,428.00

Priority of application no. 08/375,838 filed on January 20, 1995 is claimed under 35 U.S.C. § 120.

Please charge the required fee to Pennie & Edmonds LLP Deposit Account No. 16-1150. A copy of this sheet is enclosed.

Respectfully submitted,

Allan A. Fanucci 30,256
Allan A. Fanucci (Reg. No.)
PENNIE & EDMONDS LLP

Enclosure

This form is not for use with re-issue, design or plant patent applications.

LOGICALLY ORDERED ARRAYS OF COMPOUNDS AND METHODS OF MAKING AND USING THE SAME

Cross-Reference to Related Applications

This application is a continuation of U.S. application Serial No. 08/375,838, filed January 20, 1995, now pending, the content of which is incorporated herein in its entirely by reference.

Background of the Invention

The discovery of new molecules has traditionally focused in two broad areas, biologically active molecules, which are used as drugs for the treatment of life-threatening diseases, and new materials, which are used in commercial, especially high technological applications. In both areas, the strategy used to discover new molecules has involved two basic operations: (i) a more or less random choice of a molecular candidate, prepared either via chemical synthesis or isolated from natural sources, and (ii) the testing of the molecular candidate for the property or properties of interest. This discovery cycle is repeated indefinitely until a molecule possessing the desirable properties is located. In the majority of cases, the molecular types chosen for testing have belonged to rather narrowly defined chemical classes. For example, the discovery of new peptide hormones has involved work with peptides; the discovery of new therapeutic steroids has involved work with the steroid nucleus; the discovery of new surfaces to be used in the construction of computer chips or sensors has involved work with inorganic materials, etc. (for example, see R. Hirschmann, *Angew. Chem., Int. Ed. in Engl.* **1991**, *30*, 1278-1301). As a result, the discovery of new functional molecules, being, ad hoc in nature and relying predominantly on serendipity, has been an extremely time-consuming, laborious, unpredictable, and costly enterprise.

A brief account of the strategies and tactics used in the discovery of new molecules is described below. The

emphasis is on biologically interesting molecules. However, as discussed below, there are technical problems encountered in the discovery of molecules and in the development of fabricated materials which can serve as new materials for high technological applications.

Modern theories of biological activity state that biological activities, and therefore physiological states, are the result of molecular recognition events. For example, nucleotides can form complementary base pairs so that complementary single-stranded molecules hybridize resulting in double- or triple-helical structures that appear to be involved in regulation of gene expression. In another example, a biologically active molecule, referred to as a ligand, binds with another molecule, usually a macromolecule referred to as ligand-acceptor (e.g. a receptor or an enzyme), and this binding elicits a chain of molecular events which ultimately gives rise to a physiological state, e.g. normal cell growth and differentiation, abnormal cell growth leading to carcinogenesis, blood-pressure regulation, nerve-impulse-generation and -propagation, etc. The binding between ligand and ligand-acceptor is geometrically characteristic and extraordinarily specific, involving appropriate three-dimensional structural arrangements and chemical interactions.

Design and Synthesis of Mimetics of Biological Ligands

A currently favored strategy for development of agents which can be used to treat diseases involves the discovery of forms of ligands of biological receptors, enzymes, or related macromolecules, which mimic such ligands and either boost (i.e., agonize) or suppress (i.e., antagonize) the activity of the ligand. The discovery of such desirable ligand forms has traditionally been carried out either by random screening of molecules (produced through chemical synthesis or isolated from natural source's, for example, see K. Nakanishi, *Acta Pharm. Nord.*, **1992**, *4*, 319-328.), or by using a so-called "rational" approach involving identification of a lead-

structure, usually the structure of the native ligand, and optimization of its properties through numerous cycles of structural redesign and biological testing (for example see Testa, B. & Kier, L. B. *Med. Res. Rev. 1991*, 11, 35-48 and Rotstein, S. H. & Murcko, M. A. *J. Med. Chem.* **1993**, *36*, 1700-1710.). Since most useful drugs have been discovered not through the "rational" approach but through the screening of randomly chosen compounds, a hybrid approach to drug discovery has recently emerged which is based on the use of combinatorial chemistry to construct huge libraries of randomly-built chemical structures which are screened for specific biological activities. (Brenner, S. & Lerner, R. A. *Proc. Natl. Acad. Sci. USA* **1992**, *89*, 5381)

Most lead-structures which have been used in "rational" drug design are native polypeptide ligands of receptors or enzymes. The majority of polypeptide ligands, especially the small ones, are relatively unstable in physiological fluids, due to the tendency of the peptide bond to undergo facile hydrolysis in acidic media or in the presence of peptidases. Thus, such ligands are decisively inferior in a pharmacokinetic sense to nonpeptidic compounds, and are not favored as drugs. An additional limitation of small peptides as drugs is their low affinity for ligand acceptors. This phenomenon is in sharp contrast to the affinity demonstrated by large, folded polypeptides, e.g., proteins, for specific acceptors, e.g., receptors or enzymes, which can be in the subnanomolar range. For peptides to become effective drugs, they must be transformed into nonpeptidic organic structures, i.e., peptide mimetics, which bind tightly, preferably in the nanomolar range, and can withstand the chemical and biochemical rigors of coexistence with biological fluids.

Despite numerous incremental advances in the art of peptidomimetic design, no general solution to the problem of converting a polypeptide-ligand structure to a peptidomimetic has been defined. At present, "rational" peptidomimetic design is done on an ad hoc basis. Using numerous redesign-synthesis-screening cycles, peptidic ligands belonging to a

certain biochemical class have been converted by groups of organic chests and pharmacologists to specific peptidomimetics; however, in the majority of cases the results in one biochemical area, e.g., peptidase inhibitor design using the enzyme substrate as a lead, cannot be transferred for use in another area, e.g., tyrosine-kinase inhibitor design using the kinase substrate as a lead.

In many cases, the peptidomimetics that result from a peptide structural lead using the "rational" approach comprise unnatural amino acids. Many of these mimetics exhibit several of the troublesome features of native peptides (which also comprise alpha-amino acids) and are, thus, not favored for use as drugs. Recently, fundamental research on the use of nonpeptide scaffolds, such as steroidal or sugar structures, to anchor specific receptor-binding groups in fixed geometric relationships have been described (see for example Hirschmann, R. et al. *J. Am. Chem. Soc.* **1992**, *114*, 9699-9701; Hirschmann, R. et al., *J. Am. Chem. Soc.*, **1992**, *114*, 9217-9218); however, the success of this approach remains to be seen.

In an attempt to accelerate the identification of lead-structures, and also the identification of useful drug candidates through screening of randomly chosen compounds, researchers have developed automated methods for the generation of large combinatorial libraries of peptides and certain types of peptide mimetics, called "peptoids", which are screened for a desirable biological activity (see Gordon, E. M. *et al. J. Med. Chem.* **1994**, *37*, 1385-1401). For example, the method of H. M. Geysen, (*Bioorg. Med. Chem. Letters*, **1993**, *3*, 397-404; *Proc. Natl. Acad. Sci. USA* **1984**, 81, 3998) employs a modification of Merrifield peptide synthesis, wherein the C-terminal amino acid residues of the peptides to be synthesized are linked to solid-support particles shaped as polyethylene pins; these pins are treated individually or collectively in sequence to introduce additional amino-acid residues forming the desired peptides. The peptides are then screened for activity without removing

them from the pins. Houghton, (*Proc. Natl. Acad. Sci. USA* **1985**, *82*, 5131; Eichler, J. & Houghton, R. A. *Biochemistry*, **1993**, *32*, 11035-11041, and U.S. Patent No. 4,631,211) utilizes individual polyethylene bags ("tea bags") containing C-terminal amino acids bound to a solid support. These are mixed and coupled with the requisite amino acids using solid phase synthesis techniques. The peptides produced are then recovered and tested individually. S. P. A. Fodor et al., (Science **1991**, *251*, 767) described light-directed, spatially addressable parallel-peptide synthesis on a silicon wafer to generate large arrays of addressable peptides that can be directly tested for binding to biological targets. These workers have also developed recombinant DNA/genetic engineering methods for expressing huge peptide libraries on the surface of phages (Cwirla et al. *Proc. Natl. Acad. Sci. USA* **1990**, *87*, 6378; Barbas, et al. *Proc. Natl. Acad. Sci. USA* **1991**, *881*, 7978-7982).

In another combinatorial approach, V. D. Huebner and D.V. Santi (U.S. Patent No. 5,182,366) utilized functionalized polystyrene beads divided into portions each of which was acylated with a desired amino acid; the bead portions were mixed together, then divided into portions each of which was re-subjected to acylation with a second desirable amino acid producing dipeptides, using the techniques of solid phase peptide synthesis. By using this synthetic scheme, exponentially increasing numbers of peptides were produced in uniform amounts which were then separately screened for a biological activity of interest.

Zuckermann and coworkers (For examples, see Zuckermann, *et al. J. Med. Chem.* **1994**, *37*, 2678-2685 & Zuckermann, et al. *Int. J. Peptide Protein Res.* **1992**, *91*, 1) also have developed similar methods for the synthesis of peptide libraries and applied these methods to the automation of a modular synthetic chemistry for the production of libraries of N-alkyl glycine peptide derivatives, called "peptoids", which are screened for activity against a variety of biochemical targets. (See also, Symon et al., *Proc. Natl. Acad. Sci.*

USA, **1992**, *89*, 9367). Encoded combinatorial chemical syntheses have been described recently (Brenner, S. & Lerner, R. A. *Proc. Natl. Acad. Sci. USA* **1992**, *89*, 5381; Barbas, C. F. et al. *Proc. Natl. Acad. Sci. USA* **1992**, *89*, 4457-4461; see also Borchardt, A. & Still, W. C. *J. Am. Chem. Soc.* **1994**, *116*, 373-374; Kerr, J. et al. *J. Am. Chem. Soc.* **1993**, *115*, 2529-2531).

M. J. Kurth and his group (Chen, C. *et al. J. Am. Chem. Soc.* **1994**, *116*, 2661-2662.) have applied organic synthetic strategies to develop non-peptide libraries synthesized using multi-step processes on a polymer support. Although the method demonstrates the utility of standard organic synthesis in the application and development of chemical libraries, the synthetic conditions are limited by compatibility with the solid support.

The development of substrates or supports to be used in separations has involved either the polymerization/crosslinking of monomeric molecules under various conditions to produce fabricated materials such as beads, gels, or films, or the chemical modification of various commercially available fabricated materials e.g., sulfonation of polystyrene beads, to produce the desired new materials. In the majority of cases, prior art support materials have been developed to perform specific separations or types of separations and are thus of limited utility. Many of these materials are incompatible with biological macromolecules, e.g., reverse-phase silica frequently used to perform high pressure liquid chromatography can denature hydrophobic proteins and other polypeptides. Furthermore, many supports are used under conditions which are not compatible with sensitive biomolecules, such as proteins, enzymes, glycoproteins, etc., which are readily denaturable and sensitive to extreme pH's. An additional difficulty with separations carried out using these supports is that the separation results are often support-batch dependent, i.e. they are irreproducible.

Recently a variety of coatings and composite-forming materials have been used to modify commercially available fabricated materials into articles with improved properties; however the success of this approach remains to be seen.

If a chromatographic support is equipped with molecules which bind specifically with a component of a complex mixture, that component will be separated from the mixture and may be released subsequently by changing the experimental conditions (e.g., buffers, stringency, etc.) This type of separation is appropriately called "affinity chromatography" and remains an extremely effective and widely used separation technique (see Perry, E. S. in *Techniques of Chemistry*, Vol. 12 (J. Wiley) & May, S. W. in *Separations and Purification* **1978**, 3rd ed.). It is certainly much more selective than traditional chromatographic techniques, e.g chromatography on silica, alumina, silica or alumina coated with long-chain hydrocarbons, polysaccharide and other types of beads or gels which in order to attain their maximum separating efficiency need to be used under conditions that are damaging to biomolecules, e.g., conditions involving high pressure, use of organic solvents and other denaturing agents, etc. (for example see Stewart, D. J., *et al. J. Biotechnology* **1989**, *11*, 253-266; Brown, E., et al. *Int. Symp. Affinity. Chromatography & Molecular Interactions* **1979**, *86*, 37-50).

The development of more powerful separation technologies depends significantly on breakthroughs in the field of materials science, specifically in the design and construction of materials that have the power to recognize specific molecular shapes under experimental conditions resembling those found in physiological media, i.e. , these experimental conditions must involve an aqueous medium whose temperature and pH are close to the physiological levels and which contains none of the agents known to damage or denature biomolecules. The construction of these "intelligent" materials frequently involves the introduction of small molecules capable of specifically recognizing others into existing materials, e.g. surfaces, films, gels, beads, etc.,

by a wide variety of chemical modifications; alternatively molecules capable of recognition are converted to monomers and used to create the "intelligent" materials through polymerization reactions.

Advances in the ability to synthesize large numbers of peptides have made it possible to create a vast array of combinations of microenvironments within which different proteins may interact in equally. Kauvar (U.S. Patent 5,340,474) has developed a chromatographic method to obtain ligands which have the required affinity specific for a selected member of an array of analytes by providing maximal diversity in the choice of these ligands. A key to this technology is the use of a flow-through 96-well plate compatible for assaying large numbers of parallel samples. Their short peptide-based ligands as paratope analogs (or "paralogs") contain an N-terminal amino acid spacer used for coupling to the sorbent. The C-terminal is capped with an amide group. Diversity is then created with the use of hydrophobic amino acids, enantiomeric amino acids, positively charged, negatively charged, and neutral (hydrophilic) residues, as well as intra-chain cyclization via the formation of disulfide bonds between cysteine residues. Protein is then loaded onto each column in the sorbent plate, and the proteins that are bound to the chromatographic sorbents are eluted, then collected into a second pretreated microplate (Benedek, K. et al. *J. Chromatography* **1992**, *627*, 51-61). Sets of paralogs are constructed by systematically varying five independent parameters drawn from protein structure literature: 1. a hydrophobic index; 2. an isoelectric point derived from overall charge by averaging the pKa values of the ionizable side chains in solution at pH 7; 3. a hydrophobic moment; 4. an analogous lateral dipole moment; 5. a corrugation factor, defined as the measure of the scattering in the distribution of bulky side chains along the helical backbone (see Villar, H. O. & Kauvar, L. M. *FEBS Letters* **1994**, *349*, 125-130) and to defined reproducible patterns of cross-reaction which represent distinctive

spectra of the primary antigen and its analogs using an immunoassay of molecular analogs against panels of antibodies (Cheung, P. Y. K., *et al.* *Analytica Chimica Acta* **1993**, *283*, 181-192)

Definitions

This invention discloses a system for the design, synthesis and use of logically arranged collections of synthetic product molecules called "molecular constructs" from structural elements in such a manner that the collection of molecular constructs possesses a constant structural element and a variable structural element. The definitions are shown below.

A "construct" is a molecule which is a member of a collection of molecules containing a common constant structural element and a common variable structural element.

An "array" is a logical positional ordering of molecular constructs in Cartesian coordinates.

A "bond" or "chemical bond" is used to describe a group of electrons that is shared between two atoms. This term also denotes an ionic, covalent or other attractive force between two atoms.

A "building block" is any molecule useful in the assembly of a molecular construct.

The terms "fragment" or "structural diversity element" refer to the common variable structural element of a molecular construct.

The "molecular core" is the common constant structural element of a molecular construct.

A "spatial address" is a position in the array defined by unique Cartesian coordinates.

A "sub-array" is a set of spatial addresses within a given array containing those molecular constructs having a common molecular core and differ from each other by 0 (zero) or 1 (one) change in a fragment.

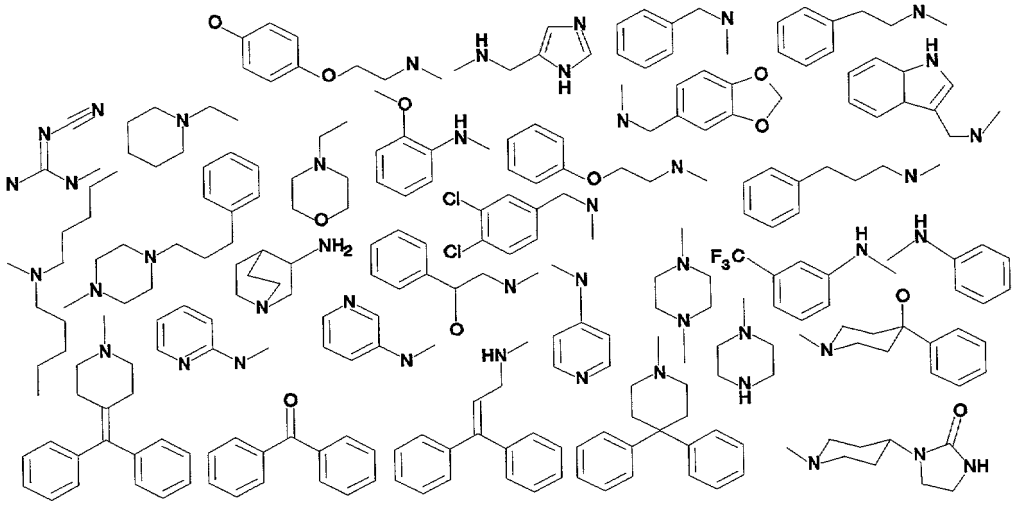
A "relative address" refers to a location within the array or sub array comparable to any selected address, and

differing by 0 (zero) or only 1 (one) change in the common variable structural element.

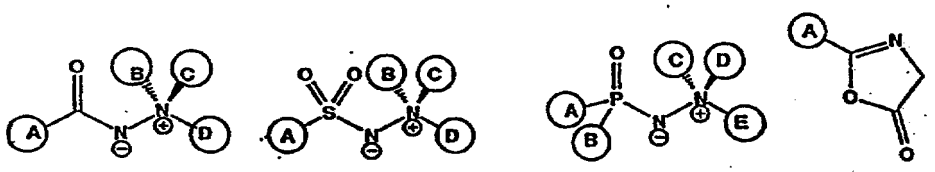
An "operator" is a simultaneous and/or concurrent change in the condition of at least two spatial addresses in individual cells residing in an array or a sub-array that results in a structural change in at least one molecular construct in the array. In particular, an operator in terms of this invention can be the reaction of at least one site on the molecular core capable of becoming or providing attachment for a structural diversity element, to add or change a structural motif thereon. Other operators which can be performed according to the patent include but are not limited to: addition of reagents or solvents; quality control protocols such as gas chromatography, high performance liquid chromatography, mass spectrometry, infrared spectroscopy, ultraviolet spectroscopy, nuclear magnetic resonance spectroscopy, fluorescence spectroscopy, melting point, mass balance, combustion analysis and thin layer chromatography; biological and enzymological assays such as ELISA, spectroscopic inhibition assays, disc assays and binding affinity assays; mechanical motions or manipulations; passage of time which includes resting & evaporation; heating and cooling; iteration of previous steps in a synthesis; dilution and dispensation of products in a form suitable for the design purpose.

Summary of the Invention

This invention is directed to an m x n array of different chemical compounds wherein each of said compounds has at least one structural diversity elements chosen from the group consisting of:



and wherein the scaffold structure is selected from the group consisting of:



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This invention is still further directed to an m x n array of different chemical compounds wherein each of said compounds has at least one of the structural diversity elements defined herein and wherein the scaffold structure may be a chemical molecule having at least three atoms of carbon, nitrogen, sulfur, phosphorus, or combinations thereof, and at least two sites on the molecule capable of undergoing a reaction to change the structure, usually by the addition of other molecules to a site capable of reacting to form or attach a structural diversity element.

This invention is still yet further directed to an n x m array of chemical compounds called molecular constructs

possessing a logical ordering of molecular constructs comprising at least one k x l sub array within the array wherein each sub array is comprised of

a) at least k.l molecular constructs having a common molecular core and differing from the other k.l molecular constructs in the sub array by at least one change in the structural diversity element attached to the molecular core; and

b) each sub array within the array is related to all other sub arrays in that all corresponding molecular constructs within each sub array has at least one change in the structural diversity elements.

Also, the array of chemical compounds above encompasses those circumstances wherein n, m, k and l are all integers greater than 1.

The above array of chemical compounds can also be directed to those circumstances wherein n > 5 and m > 1, or n > 10 and m > 1, or even wherein n > 5 and m > 5. The specific integers used for m and n are not critical and any can be selected depending upon the desired form of the array.

The above defined array of chemical compounds is also directed to arrays wherein m multiplied by n is greater than 10, greater than 20, greater than 100, greater than 200, greater than 500, greater than 1000 or even greater than 5000. Again, the final number can be any multiple of the selected m and n values.

Still yet further the present invention is directed to an n x m array of chemical compounds called molecular constructs possessing a logical ordering of molecular constructs comprising at least one k x l sub array within the array the wherein each sub array is comprised of

a) at least k.l molecular constructs having a common molecular core and differing from other k.l molecular constructs in the sub array by at least one change in the structural diversity element attached to the molecular core;

b) each sub array within the array is related to all other sub arrays in that all corresponding molecular constructs with each sub array has at least one change in the structural diversity elements; and

c) and wherein each molecular construct is equidistant from at least two of its neighboring molecular constructs.

A preferred array is that defined immediately above wherein when n and m are greater than 3 and the chemical compounds are surrounded on four sides by four equidistant neighboring other chemical compounds.

Also the present invention covers n x m arrays of chemical compounds called molecular constructs possessing a logical ordering of molecular constructs comprising at least one k x l sub array within the array wherein each sub array is comprised of

a) at least k.l molecular constructs having a common molecular core and differing from the other k.l molecular constructs in the sub array by at least one change in the structural diversity element attached to the molecular core;

b) each sub array within the array is related to all other sub arrays in that all corresponding molecular constructs within each sub array has at least one change in the structural diversity elements; and

c) and wherein each molecular construct is separated from all other molecular constructs by a container material.

The contained materials for the above cited array may employ glass, polymers, silicon, or any other material known by those of ordinary skill in the art.

Further, the present invention is directed to an n x m x q array of chemical compounds called molecular constructs possessing a logical ordering of molecular constructs

comprising at least one k x l sub array within the array wherein each sub array is comprised of

a) at least k.l molecular constructs having a common molecular core and differing from the other k.l molecular constructs in the sub array by at least one change in the structural diversity element attached to the molecular core;

b) each sub array within the array is related to all other sub arrays in that all corresponding molecular constructs within each sub array has at least one change in the structural diversity elements; and

c) and wherein q is an integer > 1 and each array designated $q_1 \ldots q_s$ where s is an integer > than 1, differs from the other q arrays by at least one function.

In addition, the present invention is directed to an n x m x q array wherein the function is the addition of an organic structure selected from the group consisting of an amine, an aldehyde, an alcohol, a ketone, a carboxylic acids, an ether and an epoxy, and wherein the function may or may not be an analytic technique.

The reactions which are the subject of this invention may be performed simultaneously by using a mechanical apparatus such as multiple pipettes attached to an apparatus and other methods known to the skilled artisan.

Brief Description of the Drawings

Figure 1 is a graphic presentation of the steps followed for combining the building blocks to form the AN-1001 array; and

Figure 2 is a scematic diagram of the process sequence used to form the compounds in the array.

Detailed Description of the Invention

This invention pertains to the logical layout, construction and testing of arrays of chemical compound for one of a variety of applications, in which the desired properties of the compound can be measured and correlated to specific ordered changes in the fragments use to construct them. The array is ordered in such a fashion as to expedite assembly, to maximize the informational content derived from the testing and to facilitate the rapid extraction of that data from the testing process. This method has great utility in accelerating the development of compounds have the optimal properties for the desired application.

The arrays are constructed from logically ordered and arranged sub-arrays of compounds. Each sub-array consists of spatially addressable sets of structurally related individual chemical compounds, ranging in number from one to 10^{12} and possessing the following properties: (1) a common structural scaffold element referred to as a "molecular core" and (2) a variable structural diversity element referred to as a fragment, in such a manner that the variation between any two compounds within a given sub-array consists only of either zero (0) or one (1) change in a fragment. These arrays may in turn be arranged in such a manner to form higher order arrays consisting of sets of arrays and tested to provide information regarding the optimum structural features available for the application.

The sub-arrays are arranged in such a manner that the direct comparisons of compounds automatically yields information regarding the effect known fragments have on a desired application, as well as on the effect on changes in physical and reactive properties. As provided by simple set theory for any number of independently variable structural diversity elements ***n***, there exists ***n*** logical higher order array arrangements, such that relational information on the effect of variation of each of the ***n*** structural diversity elements can be obtained in a similar manner by comparison of

testing data from the relative addresses in appropriately arranged sub-arrays.

An application of this invention is the rapid determination and optimization of desired biological or physical activity. An array is screened and the optimum candidate is chosen. This process can be continued in n dimensions to provide an absolute structure activity relationship ("SAR") picture of the candidate and selection in speeded by the rapid modular synthesis of arrays for use in testing. Thus in one light the invention is the most powerful tool to date for the rapid synthesis, screening and testing of compounds for IND candidacy. This method is facilitated by virtue of selecting fragments based solely upon their ability to react and participate in the process of assembly.

These arrays may be assembled to form a "super array" for exhaustive testing. This approach provides a large scale view over different structures, functionalities and spatial arrangements for exploring biological activity.

The physical construction of the array also permits the logical and rapid analysis of synthetic results for the assurance of purity and quality. By testing a series of loci within any given sub-array, it becomes possible to determine the efficacy of construction of that core, and eliminate those fragments (i.e., process development within the assembly) which do not provide satisfactory results. This system, therefore possesses the ability to learn the utility of given reagents from previous results, and either delete them from further use or alter general conditions for their efficient incorporation into the array. Thus, both positive and negative results are of value in the ultimate construction of the array, and there is no ambiguity in regards to the inclusion or exclusion of fragments.

A further application of this invention is the facilitation of the optimal analyte or epitope binding ligand for attachment to a chromatographic support for separation or purification applications. A further application of this

invention pertains to the ability to construct materials in a modular fashion, so as to facilitate their selection for such properties as strength, stability, reactivity or any other desired physical property. Whereas many methods rely upon logical choice for fragment candidates in such efforts, this method provides for the construction and testing of all candidates, thereby eliminating any compromises which traditional methods make based on the limits of time, manpower, and cost. By the screening of all possible synthetic variations the selection of the optimal candidate is a matter of data and not chemical intuition. The desired affinity can be rapidly optimized and directly correlated and attributed to the singular change made within a given sub-array. Therefore the selection of a ligand is no longer a random, intuitive process, but one of complete confidence providing exhaustive data (cf. Kauvar, L.M. U.S. Patent 5,340,474).

Furthermore the invention provides for the development of seamless technology between planning, logistical development, execution of assembly in either an arrayed or subarrayed manner, quality analysis, packaging, distribution, testing, interpretation and iteration. The invention provides for the integrated design and delivery of a unified chemical discovery system, which by application of logic and implementation of information management, has been heretofore unknown. The invention provides for the occupation of all possible spatial addresses and therefore allows for complete analysis of desired properties. This concept can be extended toward the design and manufacture of appropriate hardware and software to support the integrated aspect of this modular construction.

The logically arranged arrays of the present invention are fundamentally different from all known prior art. Testing of these arrays automatically results in the generation of complete relational structural information such that a positive result provides: (1) information on a compound within any given spatial address; (2) simultaneous

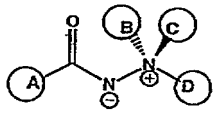
juxtaposition of this information upon a set of systematically structural congeners; (3) the ability to extract relational structural information from negative results in the presence of positive results.

All known prior art is universally directed toward the maximization of structural diversity. By definition this has excluded the acquisition of maximal data. In these cases, the relationship between individual structural variations and any resulting changes in a measurable property of the compounds can not be directly obtained from the testing results. The process of obtaining a compound having a desired physical property using methods of the prior art, while guided by intuition, is a random statistical process at best. Thus a positive result is not designed to give any additional information about the relationship between a specific structural modification and the corresponding change in the desired property, and a negative result can not provide any information at all. Methods in the prior art universally require extensive further experimentation to elucidate any relational information in a process which is costly, time consuming and one in which success is difficult to predict.

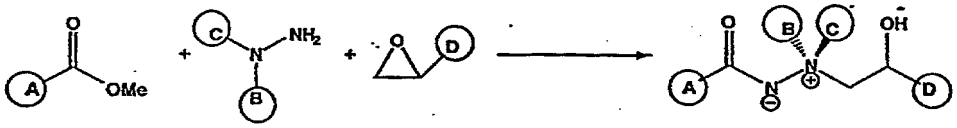
These arrays may be constructed from a wide variety of molecular cores, several examples of which are shown below. The criteria for core candidates are that the scaffold a) present attachment points for at least two structural diversity elements; b) is able to present these structural diversity elements in controlled, varying spatial arrangements; c) can be constructed in a rapid concerted fashion.

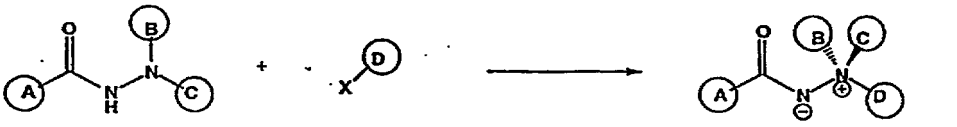
In general the molecular cores are linear, branched or cyclic organic compounds. In particular, the molecular cores comprise a chemical molecule having at least three carbon atoms and at least two sites on the molecule capable of undergoing a reaction to change the structure, usually by the addition of other molecules to a site capable of reacting to form or attach a structural diversity element.

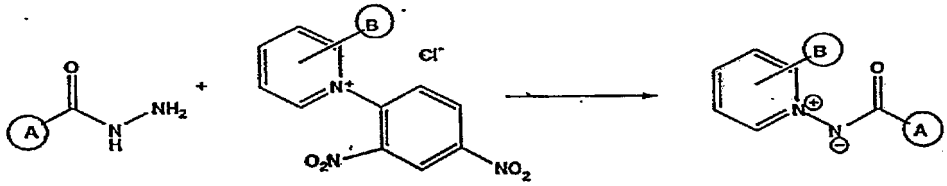
One example of a molecular core is an aminimide molecule. This is a technology which has been previously described.



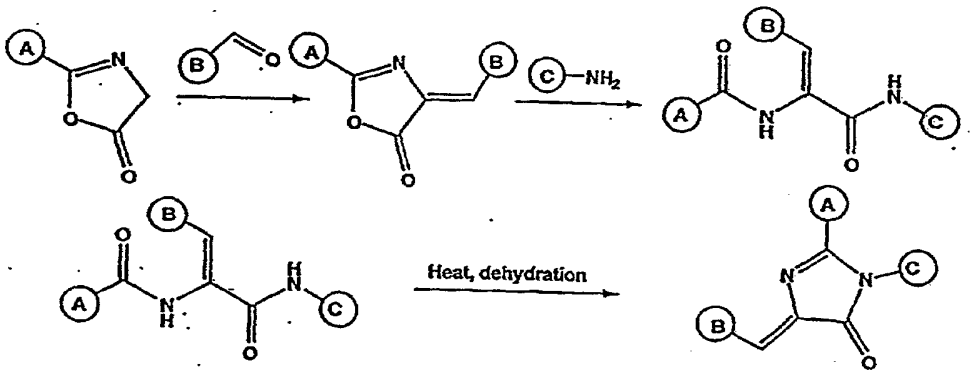
These compounds may be synthesized in a number of ways, from the reaction of an epoxide, an ester, and a hydrazine, as well as alkylation of a hydrazide, as shown below.







An example of a scaffold capable of forming a molecular core of an oxazolone molecule. Methylidene amides are formed from the sequential reaction of aldehydes, then amines with oxazolones. These compounds and their congeners may be in turn transformed into imidazolones:



These compounds and their methods of manufacture are described in PCT Patent Appl. PCT/US93/12591.

Sulfonylaminimides and phosphonylaminimides are still further examples of molecular cores which can be constructed in an analogous manner as their carbon-based counterparts, with the exception of sulfonate esters not participating in the reaction of an epoxide and hydrazine in the desired manner.

While the aminimide, oxazolone, sulphonylaminimide, and phosphonylaminimide are several examples of the concept of a molecular core, other molecular cores are possible according to the teachings of this invention. Further examples of possible molecular cores include, but are not limited to: alkaloids, quinolines, isoquinolines, benzimidazoles, benzothiazoles, purines, pyrimidines, thiazolidines, imidazopyrazinones, oxazolopyridines, pyrroles, pyrrolidines, imidazolidones, quinolones, amino acids, macrolides, penems, saccharides, xanthins, benzothiadiazine, anthracyclines, dibenzocycloheptadienes, inositols, porphyrins, corrins, and

carboskeletons presenting geometric solids (e.g., dodecahedrane).

Diels-Alder reactions, Darzens glycidic ester condensations, Simmons-Smith cyclopropanations, rhodium catalyzed carbene additions, Ugi and Passerini reactions may all be done in such a manner, as to construct these arrays as described above. The application of this technology is facile and the format in which it is constructed is amenable to most organic transformations and reaction sequences.

The structural diversity elements may be the same or different, may be of a variety of structures and may differ markedly in their physical or functional properties, or may be the same; they may also be chiral or symmetric or from a compound which is chiral or symmetric. The structural diversity elements are preferably selected from:

1) amino acid derivatives of the form $(AA)_n$, which would include, for example, natural and synthetic amino acid residues (n = 1) including all of the naturally occurring alpha amino acids, especially alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine; the naturally occurring disubstituted amino acids, such as amino isobutyric acid, and isovaline, etc.; a variety of synthetic amino acid residues, including alpha-disubstituted variants, species with olefinic substitution at the alpha position, species having derivatives, variants or mimetics of the naturally occurring side chains; N-substituted glycine residues; natural and synthetic species known to functionally mimic amino acid residues, such as statine, bestatin, etc. Peptides (n = 2 - 30) constructed from the amino acids listed above, such as angiotensinogen and its family of physiologically important angiotensin hydrolysis products, as well as derivatives, variants and mimetics made from various combinations and permutations of all the natural and synthetic residues listed above. Polypeptides (n = 31 - 70), such as big endothelin,

pancreastatin, human growth hormone releasing factor and human pancreatic polypeptide. Proteins (n > 70) including structural proteins such as collagen, functional proteins such as hemoglobin, regulatory proteins such as the dopamine and thrombin receptors.

2) a nucleotide derivative of the form $(NUCL)_n$, which includes natural and synthetic nucleotides (n = 1), such as adenosine, thymine, guanidine, uridine, cytosine, derivatives of these and a variety of variants and mimetics of the purine ring, the sugar ring, the phosphate linkage and combinations of some or all of these. Nucleotide probes (n = 2 - 25) and oligonucleotides (n > 25) including all of the various possible; homo and hetero-synthetic combinations and permutations of the naturally occurring nucleotides; derivatives and variants containing synthetic purine or pyrimidine species, or mimics of these; various sugar ring mimetics; and a wide variety of alternate backbone analogs, including but not limited to phosphodiester, phosphorothionate, phosphorodithionate, phosphoramidate, alkyl phosphotriester, sulfamate, 3'-thioformacetal, methylene(methylimino), 3-N-carbamate, morpholino carbamate and peptide nucleic acid analogs.

3) a carbohydrate derivative of the form $(CH)_n$, which would include natural physiologically active carbohydrates; related compounds, such as glucose, galactose, sialic acids, β-D-glucosylamine and nojorimycin, which are both inhibitors of glucosidase; pseudo sugars, such as 5a-carba-2-D-galactopyranose, which is known to inhibit the growth of Klebsiella pneumonia (n = 1); synthetic carbohydrate residues and derivatives of these (n = 1) and all of the complex oligomeric permutations of these as found in nature, including high mannose oligosaccharides, the known antibiotic streptomycin (n > 1).

4) a naturally occurring or synthetic organic structural motif. The term "motif" is defined as an organic molecule having or containing a specific structure that has biological activity, such as a molecule having a

complementary structure to an enzyme active site, for example. This term includes any of the well known basic structures of pharmaceutical compounds including pharmacophores, or metabolites thereof. These basic structures include beta-lactams, such as penicillin, known to inhibit bacterial cell wall biosynthesis; dibenzazepines, known to bind to CNS receptors and used as antidepressants; polyketide macrolides, known to bind to bacterial ribosymes, etc. These structural motifs are generally known to have specific desirable binding properties to ligand acceptors.

5) a reporter element, such as a natural or synthetic dye or a residue capable of photographic amplification which possesses reactive groups that may be synthetically incorporated into the sulfaminimide structure or reaction scheme, and may be attached through the groups without adversely interfering or affecting with the reporting functionality of the group. Preferred reactive groups are amino, thio, hydroxy, carboxylic acid, carboxylic acid ester, particularly methyl ester, acid chloride, isocyanate alkyl halides, aryl halides and oxirane groups.

6) an organic moiety containing a polymerizable group such as a double bond, or other functionalities capable of undergoing condensation polymerization or copolymerization. Suitable groups include vinyl groups, oxirane groups, carboxylic acids, acid chlorides, esters, amides, azlactones, lactones and lactams. Other organic moiety such as those defined for R and R' may also be used.

7) a macromolecular component, such as a macromolecular surface or structures which may be attached to the sulfaminimide modules via the various reactive groups outlined above, in a manner where the binding of the attached species to a ligand-receptor molecule is not adversely affected and the interactive activity of the attached functionality is determined or limited by the macromolecule. Examples of macromolecular components include porous and non-porous inorganic components, such as, for example, silica, alumina, zirconia, titania and the like, as commonly used for

various applications, such as normal and reverse phase chromatographic separations, water purification, pigments for paints, etc.; porous and non-porous organic macromolecular components, including synthetic components such as styrenedivinyl benzene beads, various methacrylate beads, PVA beads, and the like, commonly used for protein purification, water softening; and a variety of other applications, natural components such as native and functionalized celluloses, such as, for example, agarose and chitin, sheet and hollow fiber membranes made from nylon, polyether sulfone or any of the materials mentioned above. The molecular weight of these macromolecules may range from about 1000 Daltons to as high as possible. They may take the form of nano-particles (dp = 1000 - 5000 Angstroms), latex particles (dp = 1000 - 5000 Angstroms), porous or non-porous beads (dp = 0.5 - 1000 microns), membranes, gels, macroscopic surfaces or functionalized or coated versions or composites.

Structural diversity elements may also be a chemical bond to a suitable organic moiety, a hydrogen atom, an organic moiety which contains a suitable electrophilic group, such as an aldehyde, ester, alkyl halide, ketone, nitrile, epoxide or the like; a suitable nucleophilic group, such as a hydroxyl, amino, carboxylate, amide, carbanion, urea or the like; or one of the other structural diversity elements defined below. In addition, structural diversity elements may join to form a ring, bi-cyclic or tri-cyclic ring system; or structure which connects to the ends of the repeating unit of the compound defined by the preceding formula; or may be separately connected to other moieties.

Structural diversity elements on a scaffold may be the same or different and each may be one or more atoms of carbon, nitrogen, sulfur, oxygen, any other inorganic elements or combinations thereof. The structural diversity elements may be cyano, nitro, halogen, oxygen, hydroxy, alkoxy, thio, straight or branched chain alkyl, carbocyclic aryl and substituted or heterocyclic derivatives thereof. Structural diversity elements may be different in adjacent

molecular cores and have a selected stereochemical arrangement about the carbon atom to which they are attached.

As used herein, the phrase linear chain or branched chained alkyl groups means any substituted or unsubstituted acyclic carbon-containing compounds, including alkanes, alkenes and alkynes. Alkyl groups having up to 30 carbon atoms are preferred. Examples of alkyl groups include lower alkyl, for example, methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl or tert-butyl; upper alkyl, for example, octyl, nonyl, decyl, and the like; lower alkylene, for example, ethylene, propylene, propyldiene, butylene, butyldiene; upper alkenyl such as 1-decene, 1-nonene, 2,6-dimethyl-5-octenyl, 6-ethyl-5-octenyl or beptenyl, and the like; alkynyl such as 1-ethynyl, 2-butynyl, 1-pentynyl and the like. The ordinary skilled artisan is familiar with numerous linear and branched alkyl groups, which are within the scope of the present invention.

In addition, such alkyl group may also contain various substituents in which one or more hydrogen atoms has been replaced by a functional group. Functional groups include but are not limited to hydroxyl, amino, carboxyl, amide, ester, ether, and halogen (fluorine, chlorine, bromine and iodine), to mention but a few. Specific substituted alkyl groups can be, for example, alkoxy such as methoxy, ethoxy, butoxy, pentoxy and the like, polyhydroxy such as 1,2-dihydroxypropyl, 1,4-dihydroxy-1-butyl, and the like; methylamino, ethylamino, dimethylamino, diethylamino, triethylamino, cyclopentylamino, benzylamino, dibenzylamino, and the like; propionic, butanoic or pentanoic acid groups, and the like; formamido, acetamido, butanamido, and the like, methoxycarbonyl, ethoxycarbonyl or the like, chloroformyl, bromoformyl, 1, 1-chloroethyl, bromoethyl, and the like, or dimethyl or diethyl ether groups or the like.

As used herein, substituted and unsubstituted carbocyclic groups of up to about 20 carbon atoms means cyclic carbon-containing compounds, including but not limited to cyclopentyl, cyclohexyl, cycloheptyl, adamantyl, and the

like. Such cyclic groups may also contain various substituents in which one or more hydrogen atoms has been replaced by a functional group. Such functional groups include those described above, and lower alkyl groups as described above. The cyclic groups of the invention may further comprise a heteroatom. For example, in a specific embodiment, structural diversity element A is cyclohexanol.

As used herein, substituted and unsubstituted aryl groups means a hydrocarbon ring bearing a system of conjugated double bonds, usually comprising (4p - 2) pi bond electrons, where p is an integer equal to or greater than 1. Examples of aryl groups include, but are not limited to, phenyl, naphthyl, anisyl, toluyl, xylenyl and the like. According to the present invention, aryl also includes aryloxy, aralkyl, aralkyloxy and heteroaryl groups, e.g., pyrimidine, morpholine, piperazine, piperidine, benzoic acid, toluene or thiophene and the like. These aryl groups may also be substituted with any number of a variety of functional groups. In addition to the functional groups described above in connection with substituted alkyl groups and carbocyclic groups, functional groups on the aryl groups can be nitro groups.

As mentioned above, structural diversity elements can also represent any combination of alkyl, carbocyclic or aryl groups; for example, 1-cyclohexylpropyl, benzylcyclohexylmethyl, 2-cyclohexyl-propyl, 2,2-methylcyclohexylpropyl, 2,2methylphenylpropyl, 2,2-methylphenylbutyl, and the like.

The structural diversity element may also be a connecting group that includes a terminal carbon atom for attachment to the quaternary nitrogen and may be different in adjacent n units.

In one embodiment of the invention, at least one of the structural diversity elements represents an organic or inorganic macromolecular surface. Examples of preferred macromolecular surfaces include ceramics such as silica and alumina, porous and non-porous beads, polymers such as a

latex in the form of beads, membranes, gels, macroscopic surfaces or coated versions or composites or hybrids thereof.

All publications, patents, and patent applications are herein specifically incorporated by reference to their relevant portions (cf. The Merck Index, 11th Ed., Budavari, S. Ed., Merck & Co., Rahway, NJ, 1989; Physicians Desk Reference, 44th Ed., Barnhart, E. D. Publ., Medical Economics Company Inc., Oradell, NJ, 1990.

The following experimentals are meant to exemplify but one embodiment of the present invention and are not intended to limit the invention thereto.

Examples

A 10,240-component array is synthesized according to the teaching of the invention, from eight oxazolones (Building Block A), 32 aldehydes (Building Block B), and 40 amines (Building Block C). These compounds are illustrated in Tables 1-3.

AN 1001 Protocol: Tetrahydrofuran (THF) solutions of the building blocks are prepared according to the protocols generated on the spread sheets entitled "AN 1001 SOLUTION PROTOCOLS. CALCULATIONS, AND BUILDING BLOCK SELECTION". The Building Block solutions are 250 mM in "A", 250 mM in "B", and 500 mM in "C". Sufficient volumes of each solution are prepared to allow for the production of one row of reaction plates (Px, where x= 1-128 for AN 1001). A reaction plate contains 80 spatial addresses each (8 X 10) and a row contains 16 reaction plates. The entire array consists of 8 rows of these reaction plates which are recycled 16 at a time to complete production of the array. The initial cycle's first operator is spatial delivery of 200 μl (1 eq., 50 μmoles) of the "A" building block solution according to the spread sheet entitled "AN 1001 SPATIAL LAYOUT, "A" BUILDING BLOCKS" starting at P1 and ending at P16. The second operator is spatial delivery of 200 μl (1 eq., 50 μmoles) of the "B" Building Blocks to the same reaction plates according to the spread sheet entitled "AN 1001 SPATIAL LAYOUT, "B"

BUILDING BLOCKS." The third operator is addition to the same reaction plates of 50 μL of a I M (1 eq., 50 μmoles) solution of triethylamine in THF to all the spatial addresses that "A" and "B" building Blocks were added. The forth operator is placement of the reaction blocks on an agitator at 60 degrees centigrade for 1.5 hrs. The fifth operator is spatial addition of 100 μl (1 eq., 50 μmoles) of the "C" building, block solutions according to the spread sheet entitled "AN 1001 SPATIAL LAYOUT, "C" BUILDING BLOCKS." The sixth operator is addition of 200 μL of THF to all the spatial addresses in the row or cycle. The seventh operator allows the reaction plates to stand at 25 decrees centigrade for 16 hrs. enabling evaporation of THF and completion of the synthesis of the molecular constructs. The following operators are then applied to distribute and reformat the molecular constructs for delivery and quality control. Heat the reaction plates to 60 degrees centigrade for 10 minutes and add 400 μl of dimethylsulfoxide (DMSO) to dissolve the molecular constructs (operator 8). Remove the solution from the reaction plates and place in a plastic microtiter plates in a special manner (operator 9). Specially wash the reaction plates (each address) with 4 times 325 μL of DMSO and place in the same microtiter plates (operator 10). This affords 29.4 mM solutions of the molecular constructs in DMSO ready for further spacial distribution. Remove a 10 μL aliquot following a unique address pattern layout from each microtiter plate for quality control (operator 11). Specially reformat these aliquots, dilute with 300 μL of acetonitrile and subject these samples to analysis by High Performance Liquid Chromatography and Mass Spectrometry for quality control of the molecular constructs in the each microtiter plate (operator 12). The above cycles and operators are repeated 7 more times to finish production and quality controlled validation of the array, AN 1001.

Figure 1 is a graphic representation of the array vertex to illustrate how the building blocks are combined to prepare the compounds in the array, while Figure 2 is a schematic

diagram of the process sequence used to form the compounds in the array and to validate their locations. An expanded view of a single reaction plate layout or template for the array is shown in Table 4.

AN 1001 SOLUTION PROTOCOLS, CALCULATIONS AND BUILDING BLOCK SELECTION				
AT THEORY, ENTER				
	#	mM	uM/Well	Equiv.
"A" BUILDING BLOCKS	8	250	50	1
"B" BUILDING BLOCKS	32	250	50	1
"C" BUILDING BLOCKS	40	500	50	1
# ADDRESSES/REACTION PLATE	80			

CALCULATE, ACTUAL	PER ADDRESS		
	Um	uL	mM
PER "A"	50	200	250
PER "B"	50	200	250
PER "C"	50	100	500

	# ADDRESSES			# REACTION PLATES		
	TOTAL	ROW	COLUMN	TOTAL	ROW	COLUMN
PER "A"	1280	1280	80	16	16	1
PER "B"	320	40	320	4	0.5	4
PER "C"	256	32	16	3.2	0.4	0.2
ARRAY	10240	1280	640	128	16	8

	ml used			mMoles used		
	TOTAL	ROW	COLUMN	TOTAL	ROW	COLUMN
PER "A"	256	256	16	64	64	4
PER "B"	64	8	64	16	2	16
PER "C"	25.6	3.2	1.6	12.8	1.6	0.8

ENTER ACTUAL AMOUNTS DESIRED FROM ABOVE CALCULATIONS			
	VOL (ml)	mM	Excess %
PER "A"	250	250	20
PER "B"	10	250	20
PER "C"	10	500	200

GENERATE SOLUTION PROTOCOLS

"A" BUILDING BLOCKS								VOLUME mL.		
Name	%	A#	Barcode	MW	d	uL	mg	Final	Est. Liq.	Est. Solid
4-Phenyloxazolone	95	A1	00137-41	161		#DIV/01	12711	300	#DIV/01	287
m-Methoxzyoxazolone	95	A2	00703-41	191		#DIV/01	15079	300	#DIV/01	285
2-Naphthaloxazolone	95	A3	00701-41	211		#DIV/01	16658	300	#DIV/01	283
Thiopheneoxazlone	95	A4	00704-41	167		#DIV/01	13184	300	#DIV/01	287
Trifluoro-p-tolualoxazolone	95	A5	00702-41	229		#DIV/01	18079	300	#DIV/01	282
2,4-Dichloro-oxazolone	95	A6	00776-41	229		#DIV/01	18079	300	#DIV/01	282
p-Tolualoxazolone	95	A7	00700-41	175		#DIV/01	13816	300	#DIV/01	286
m-Tolualoxazolone	95	A8	00775-41	175		#DIV/01	13816	300	#DIV/01	286

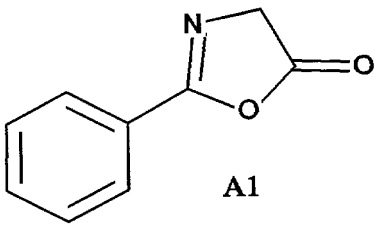
"B" BUILDING BLOCKS								VOLUME mL		
Name	%	B#	BARCODE	MW	d	uL	mg	Final	Est. Liq.	Est. Solid
2,4-Difluorobenz-aldehyde	98	B1	00116-41	142.11	1.299	334.9	435.03	12	11.665	12
2-Fluorobenzaldehyde	97	B2	00062-41	124.11	1.178	325.84	383.85	12	11.674	12
3-Fluorobenzaldehyde	97	B3	00007-41	124.11	1.17	328.07	383.85	12	11.672	12
4-Fluorobenzaldehyde	98	B4	00258-41	124.11	1.157	328.37	379.93	12	11.672	12
aaa-Trifluoro-o-tolualdehyde	98	B5	00073-41	174.12	1.32	403.8	533.02	12	11.596	11
aaa-Trifluoro-m-tolualdehyde	97	B6	00072-41	174.12	1.301	413.92	538.52	12	11.586	11
aaa-Trifluoro-p-tolualdehyde	98	B7	00005-41	174.12	1.275	418.06	533.02	12	11.582	11
o-Tolualdehyde	97	B8	00086-41	120.15	1.039	357.65	371.6	12	11.642	12
m-Tolualdehyde	97	B9	00097-41	120.15	1.019	364.67	371.6	12	11.635	12
p-Tolualdehyde	97	B10	00037-41	120.15	1.019	364.67	371.6	12	11.635	12

4-Ethylbenzaldehyde	98	B11	00108-41	134.18	0.979	419.57	410.76	12	11.58	12
Benzaldehyde	99	B12	00260-41	106.12	1.044	308.82	321.58	12	11.692	12
2-Chlorobenzaldehyde	99	B13	00029-41	140.57	1.248	341.32	425.97	12	11.659	12
3-Chlorobenzaldehyde	97	B14	00069-41	140.57	1.241	350.32	434.75	12	11.65	12
2,4-Dichlorobenz-aldehyde	99	B15	00646-41	175.01	Solid	#VALUE	530.33	12	#VALUE	11
M-Anisaldehyde	97	B16	00094-41	136.15	1.119	376.3	421.08	12	11.624	12
4-(Methylithio)-benzaldehyde	95	B17	00173-41	152.22	1.144	420.19	480.69	12	11.68	12
4-Biphenylcar-boxaldehyde	95	B18	00256-41	182.2	Solid	#VALUE	575.37	12	#VALUE	11
1-Naphthaldehyde	98	B19	00113-41	156.18	1.15	415.74	478.1	12	11.684	12
4-(Trifluorometh-oxy)-benzaldehyde	96	B20	00171-41	190.12	1.331	446.37	594.13	12	11.654	11
3-Phenoxybenz-aldehyde	95	B21	00125-42	198.22	1.147	545.73	625.96	12	11.454	11
2-Thiophenecarbox-aldehyde	98	B22	00170-41	112.15	1.2	286.1	343.32	12	11.714	12
3-Thiophenecarbox-aldehyde	98	B23	00643-41	112.15	1.28	268.22	343.32	12	11.732	12
3,5-Difluorobenz-aldehyde	98	B24	00121-41	142.11		#DIV/01	435.03	12	#DIV/01	12
3-Pyridinecarbox-aldehyde	99	B25	00174-41	107.11	1.135	285.97	324.68	12	11.714	12
4-Pyridinecarbox-aldehyde	98	B26	00172.41	107.11	1.122	292.24	327.89	12	11.708	12
4-Chlorobenzaldehyde	97	B27	00057-41	140.57	solid	#VALUE	434.75	12	#VALUE	12
3-Quinolinecarbox-aldehyde	98	B28	00691-41	157.17	solid	#VALUE	481.13	12	#VALUE	12
4-Quinolinecarbox-aldehyde	97	B29	00693-41	157.17	solid	#VALUE	486.09	12	#VALUE	12
2-Furaldehyde	99	B30	00650-41	96.09	1.16	251.02	291.18	12	11.749	12
3-Furaldehyde	99	B31	00641-41	98.09	1.111	262.09	291.18	12	11.738	12
5-Methylfurfural	99	B32	00692-41	110.11	1.107	301.42	333.67	12	11.699	12

"C" BUILDING BLOCKS								VOLUME mL.		
Name	%	C#	BARCODE	MW	d	uL	mg	Final	Est. Liq.	Est. Solid
Tetrahydrofur-furylamine	97	C1	00042-42	101.15	0.98	1596.1	1564.2	30	28.404	28
Isobutylamine	99	C2	00664-41	73.14	0.736	1505.7	1108.2	30	28.494	29
(+-)-sec-Butylamine	99	C3	00665-41	73.14	0.72	1539.1	1108.2	30	28.461	29
Cyclobutylamine	98	C4	00182-41	71.12	0.833	1306.8	1088.6	30	28.693	29
Cyclohexylamine	99	C5	00034-42	99.18	0.867	1733.2	1502.7	30	28.267	28
1-Ethylpropylamine	98	C6	00225-41	87.17	0.748	1783.7	1334.2	30	28.216	29
Ethanol amine	99	C7	00071-42	61.08	1.012	914.48	925.45	30	29.086	29
(S)-(+)-1-Amino-2-propanol	99	C8	00120-42	75.11	0.954	1192.9	1138	30	28.807	29
2-Amino-1-phenylethanol	98	C9	00176-42	137.18	solid	#VALUE	2099.7	30	#VALUE	28
(1R,2S)-(-)-Ephidrine	99	C10	00667-41	165.24	1.124	2227.4	2503.6	30	27.773	27
(R)-(-)-Leucinol	98	C11	00177-41	117.19	0.917	1956.1	1793.7	30	28.044	28
Piperidine	99	C12	00021-43	85.15	0.861	1498.4	1290.2	30	28.502	29
4-Benzylpiperidine	99	C13	00222-42	175.28	0.997	2663.7	2655.6	30	27.336	27
Morpholine	99	C14	00031-41	87.12	0.999	1321.3	1320	30	28.679	29
1-Methyl-3-phenylpropylamine	97	C15	00084-41	149.24	0.922	2503.1	2307.8	30	27.497	28
3-Phenyl-1-propylamine	98	C16	00004-41	135.21	0.951	2176.2	2069.5	30	27.824	28
Benzylamine	99	C17	00020-42	107.16	0.981	1655.1	1623.6	30	28.345	28
Phenethylamine	99	C18	00008-41	121.18	0.965	1902.7	1836.1	30	28.097	28
1,2,3,4-Tetrahydro-1-naphthylamine	98	C19	00085-41	147.22	1.026	2198.3	2253.4	30	27.804	28
2-(p-Tolyl)ethyl-amine	97	C20	00118-42	135.21	0.93	2248.3	2090.9	30	27.752	28
Aminodiphenylmethane	96	C21	00081-41	183.25	1,063	2693.6	2863.3	30	27.306	27
2,2-Diphenethylamine	96	C22	00024-41	197.28	solid	#VALUE	3082.5	30	#VALUE	27

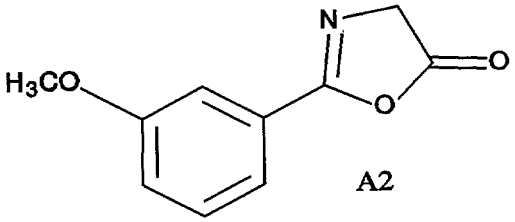
"C" BUILDING BLOCKS								VOLUME mL.		
Name	%	C#	BARCODE	MW	d	uL	mg	Final	Est. Liq.	Est. Solid
Tetrahydrofur-furylamine	97	C1	00042-42	101.15	0.98	1596.1	1564.2	30	28.404	28
Isobutylamine	99	C2	00664-41	73.14	0.736	1505.7	1108.2	30	28.494	29
(+-)-sec-Butylamine	99	C3	00665-41	73.14	0.72	1539.1	1108.2	30	28.461	29
Cyclobutylamine	98	C4	00182-41	71.12	0.833	1306.8	1088.6	30	28.693	29
Cyclohexylamine	99	C5	00034-42	99.18	0.867	1733.2	1502.7	30	28.267	28
1-Ethylpropylamine	98	C6	00225-41	87.17	0.748	1783.7	1334.2	30	28.216	29
Ethanol amine	99	C7	00071-42	61.08	1.012	914.48	925.45	30	29.086	29
(S)-(+)-1-Amino-2-propanol	99	C8	00120-42	75.11	0.954	1192.9	1138	30	28.807	29
2-Amino-1-phenylethanol	98	C9	00176-42	137.18	solid	#VALUE	2099.7	30	#VALUE	28
(1R,2S)-(-)-Ephidrine	99	C10	00667-41	165.24	1.124	2227.4	2503.6	30	27.773	27
(R)-(-)-Leucinol	98	C11	00177-41	117.19	0.917	1956.1	1793.7	30	28.044	28
Piperidine	99	C12	00021-43	85.15	0.861	1498.4	1290.2	30	28.502	29
4-Benzylpiperidine	99	C13	00222-42	175.28	0.997	2663.7	2655.6	30	27.336	27
Morpholine	99	C14	00031-41	87.12	0.999	1321.3	1320	30	28.679	29
1-Methyl-3-phenylpropylamine	97	C15	00084-41	149.24	0.922	2503.1	2307.8	30	27.497	28
3-Phenyl-1-propylamine	98	C16	00004-41	135.21	0.951	2176.2	2069.5	30	27.824	28
Benzylamine	99	C17	00020-42	107.16	0.981	1655.1	1623.6	30	28.345	28
Phenethylamine	99	C18	00008-41	121.18	0.965	1902.7	1836.1	30	28.097	28
1,2,3,4-Tetrahydro-1-naphthylamine	98	C19	00085-41	147.22	1.026	2198.3	2253.4	30	27.804	28
2-(p-Tolyl)ethyl-amine	97	C20	00118-42	135.21	0.93	2248.3	2090.9	30	27.752	28
Aminodiphenylmethane	96	C21	00081-41	183.25	1,063	2693.6	2863.3	30	27.306	27
2,2-Diphenethylamine	96	C22	00024-41	197.28	solid	#VALUE	3082.5	30	#VALUE	27

TABLE 1
"A" BUILDING BLOCKS
ARRAY AN 1001



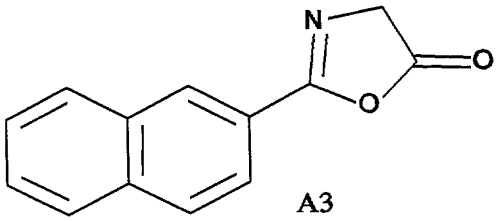
A1

4-Phenyloxazolone



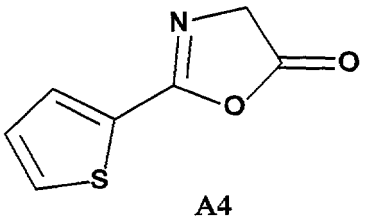
A2

m-Methoxyoxazolone



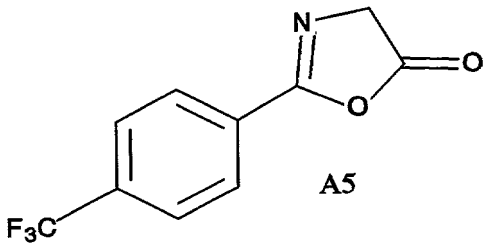
A3

2-Napthaloxazolone



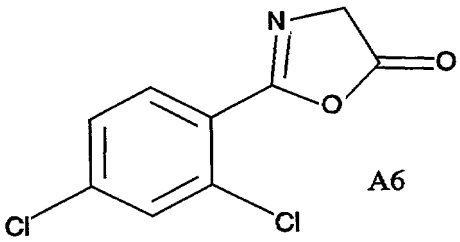
A4

Thiopheneoxazolone



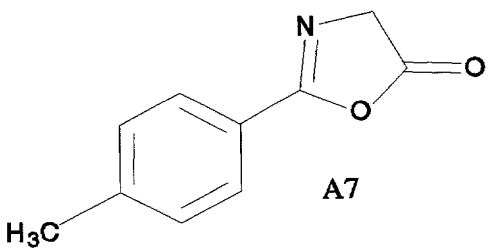
A5

Trifluoro-p-tolualoxazolone



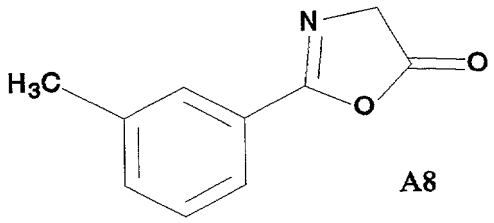
A6

2,4-Dichloroxazolone



A7

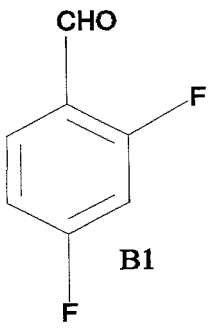
p-Tolualoxazolone



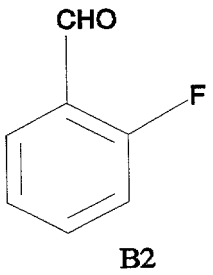
A8

m-Tolualoxazolone

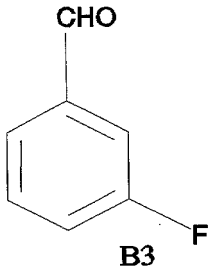
TABLE 2
"B" BUILDING BLOCKS
ARRAY AN 1001



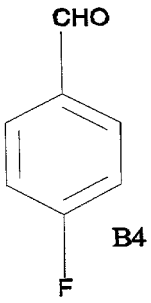
2,4-Difluorobenzaldehyde



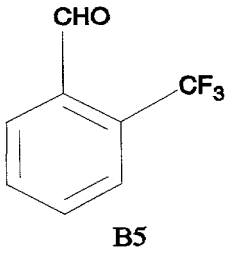
2-Fluorobenzaldehyde



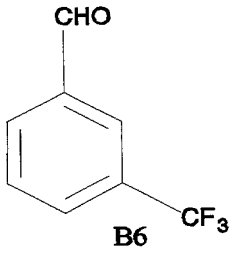
3-Fluorobenzaldehyde



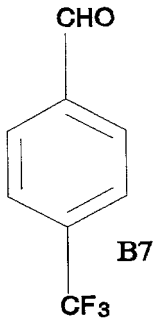
2-Fluorobenzaldehyde



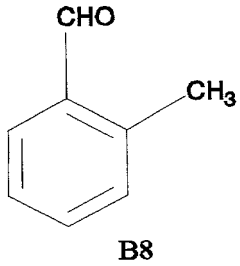
aaa-Trifluoro-o-tolualdehyde



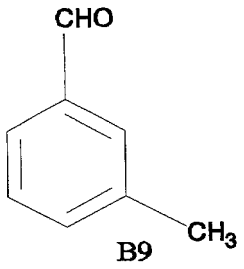
aaa-Trifluoro-m-tolualdehyde



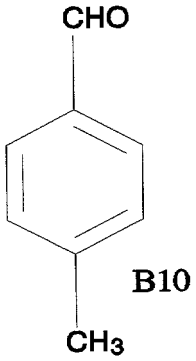
aaa-Trifluoro-p-tolualdehyde



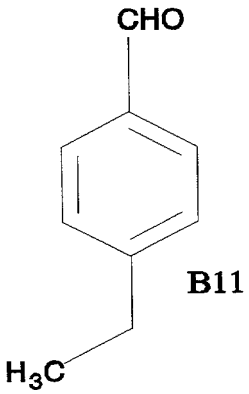
o-Tolualdehyde



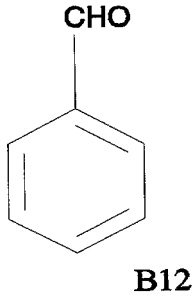
m-Tolualdehyde



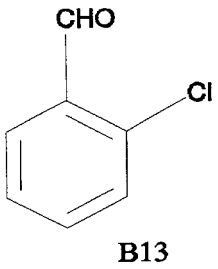
p-Tolualdehyde



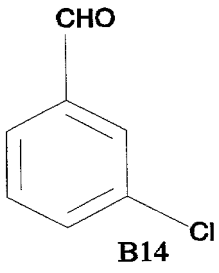
4-Ethylbenzaldehyde



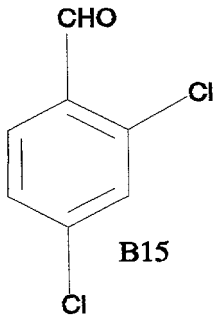
Benzaldehyde



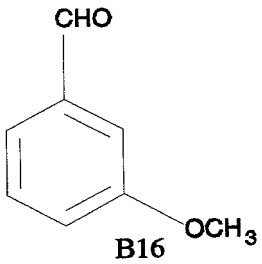
2-Chlorobenzaldehyde



3-Chlorobenzaldehyde

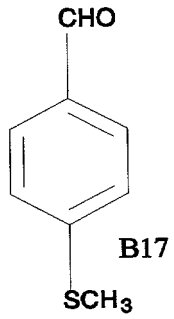


2,4-Dichlorobenzaldehyde



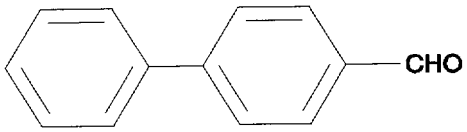
B16

m-Anisaldehyde

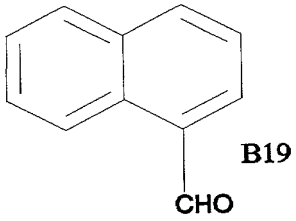


B17

4-(Methylthio)-benzaldehyde

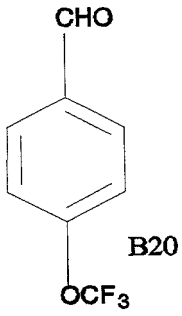


4-Biphenylcarboxaldehyde



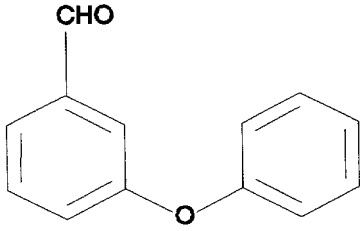
B19

1-Napthaldehyde



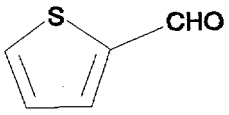
B20

4-(Trifluoromethoxy)-benzaldehyde



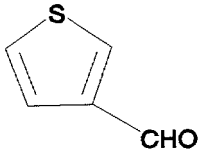
B21

3-Phenoxybenzaldehyde



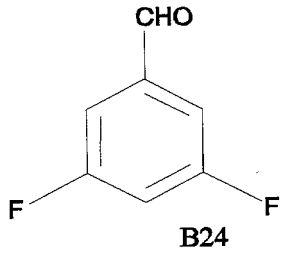
B22

2-Thiophenecarboxaldehyde



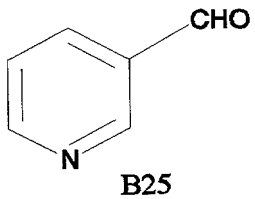
B23

3-Thiophenecarboxaldehyde



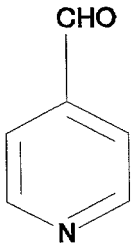
B24

3,5-Difluorobenzaldehyde



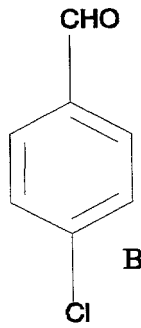
B25

3-Pyridinecarboxaldehyde



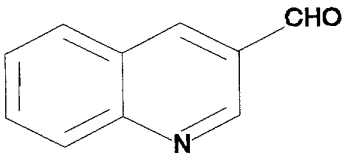
B26

4-Pyridinecarboxaldehyde



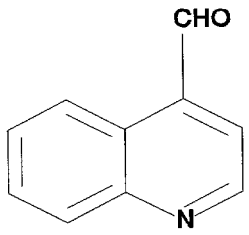
B27

4-Chlorobenzaldehyde



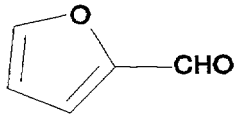
B28

3-Quinolinecarboxaldehyde



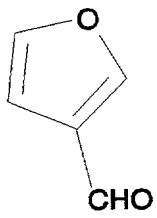
B29

4-Quinolinecarboxaldehyde



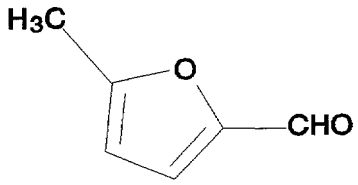
B30

2-Furaldehyde



B31

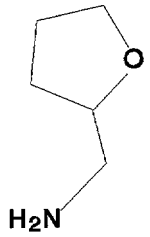
3-Furaldehyde



B32

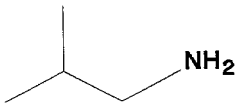
5-Methylfurfural

TABLE 3
"C" BUILDING BLOCKS
ARRAY AN 1001



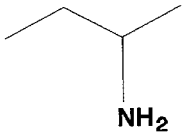
C1

Tetrahydrofurfurylamine



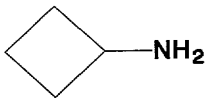
C2

Isobutylamine



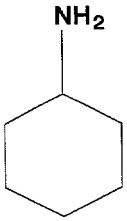
C3

(+)-sec-Butylamine



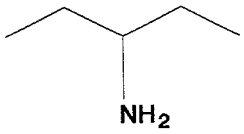
C4

Cyclobutylamine



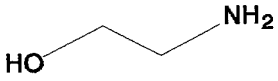
C2

Cyclohexylamine



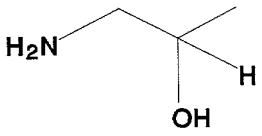
C3

1-Ethylpropylamine



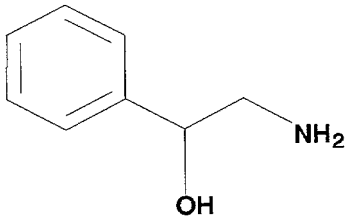
C7

Ethanolamine



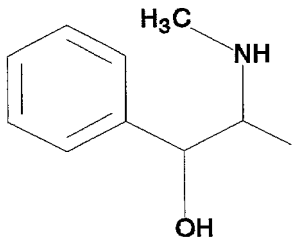
C8

(S)-(+)-1-Amino-2-propanol



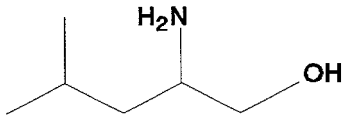
C9

2-Amino-1-phenylethanol



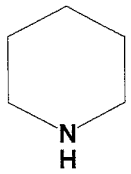
C10

(1R,2S)-(-)-Ephidrine



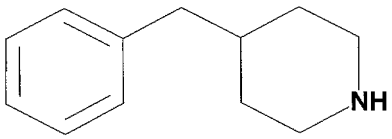
C11

(rR)-(-)-Leucinol



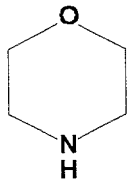
C12

Piperidine



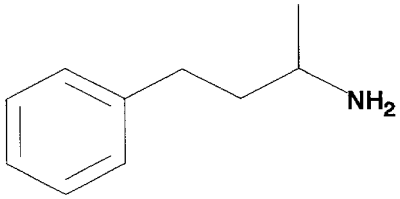
C13

4-Benzylpiperidine



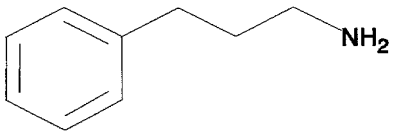
C14

Morpholine



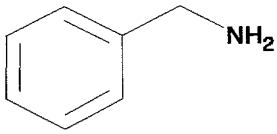
C15

1-Methyl-3-phenylpropylamine



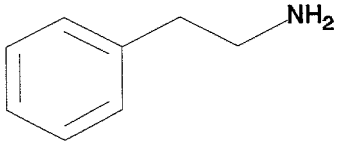
C16

3-Phenyl-1-propylamine



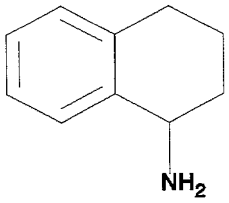
C17

Benzylamine



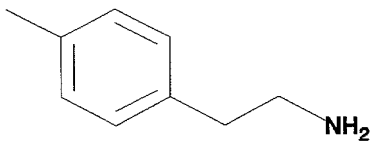
C18

Phenethylamine



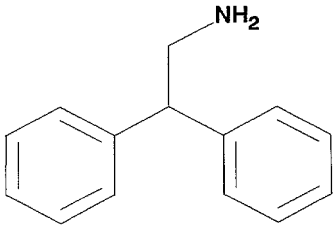
C19

1,2,3,4-Tetrahydro-1-napthylamine



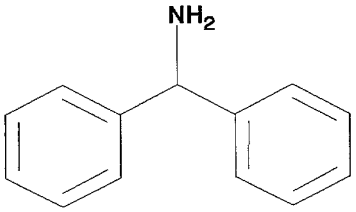
C20

2-(p-Tolyl)ethylamine



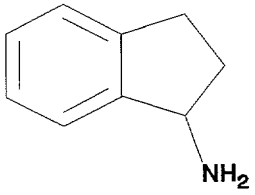
C21

Aminodiphenylmethane



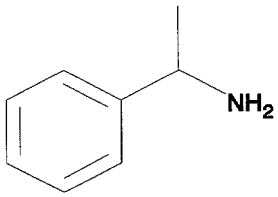
C22

2,2-Diphenethylamine



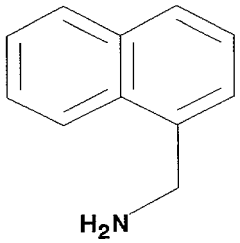
C23

1-Aminodan



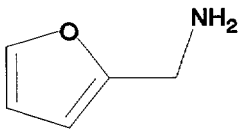
C24

(+-)-a-Methylbenzylamine



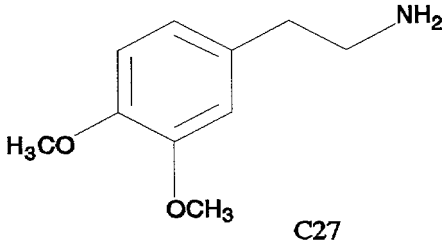
C25

1-Napthalene-methylamine



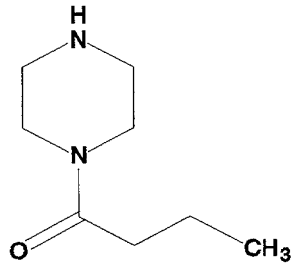
C26

Furfurylamine



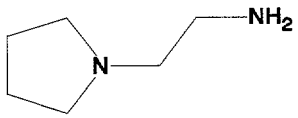
C27

3,4-Dimethoxyphenethylamine



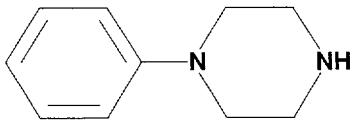
C28

Ethyl 1-piperazine carboxylate



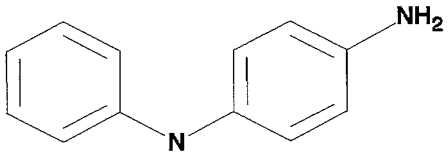
C29

1-(2-Aminoethyl)pyrrolidine



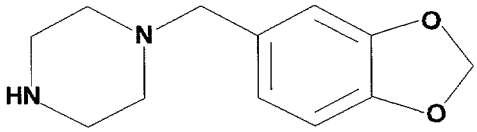
C30

1-Phenylpiperazine



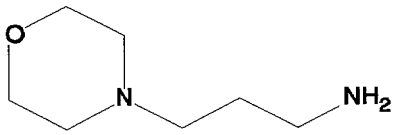
C31

4-Amino-1-benzylpiperidine



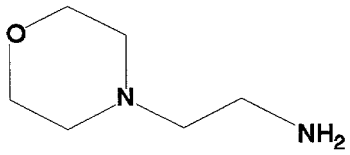
C32

1-Piperionylpiperazine



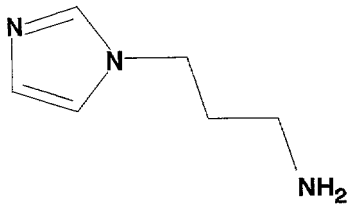
C33

4-(3-Aminopropyl)-morpholine



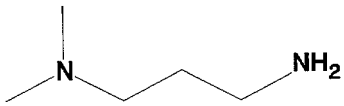
C34

4-(2-Aminoethyl)-morpholine



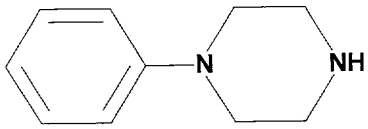
C35

1-(3-Aminopropyl)imidazole



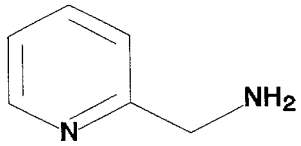
C36

3-Dimethylaminopropylamine



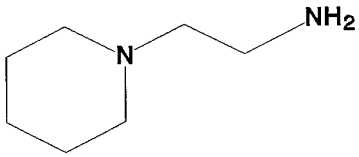
C37

1-(a,a,a-Trifluoro-m-tolyl)-piperazine



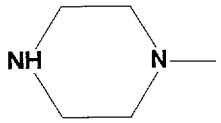
C38

2-(Aminoethyl)pyridine



C39

1-(2-Aminoethyl)piperidine

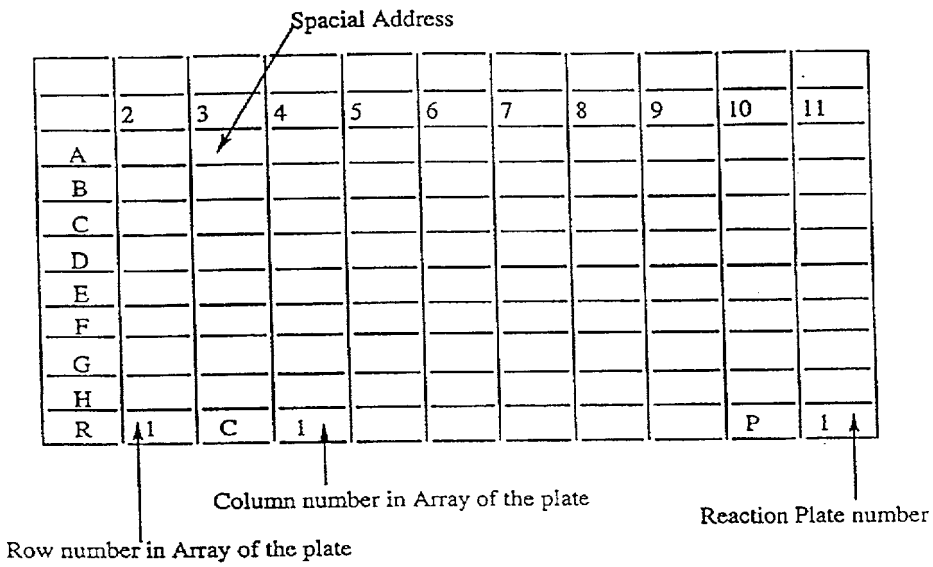


C40

1-Methylpiperazine

TABLE 4

EXPANDED VIEW OF A SINGLE REACTION PLATE LAYOUT / TEMPLATE ARRAY, AN 1001



BB1

	A	1								
	2	3	4	5	6	7	8	9	10	11
A	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
B	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
C	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
D	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
E	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
F	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
G	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
H	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
R	1	C	1						P	1

	A	1				
	2	3	4	5	6	7
A	A1	A1	A1	A1	A1	A1
B	A1	A1	A1	A1	A1	A1
C	A1	A1	A1	A1	A1	A1
D	A1	A1	A1	A1	A1	A1
E	A1	A1	A1	A1	A1	A1
F	A1	A1	A1	A1	A1	A1
G	A1	A1	A1	A1	A1	A1
H	A1	A1	A1	A1	A1	A1
R	1	C	2			

	A	2								
	2	3	4	5	6	7	8	9	10	11
A	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
B	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
C	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
D	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
E	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
F	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
G	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
H	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
R	2	C	1						P	17

	A	2				
	2	3	4	5	6	7
A	A2	A2	A2	A2	A2	A2
B	A2	A2	A2	A2	A2	A2
C	A2	A2	A2	A2	A2	A2
D	A2	A2	A2	A2	A2	A2
E	A2	A2	A2	A2	A2	A2
F	A2	A2	A2	A2	A2	A2
G	A2	A2	A2	A2	A2	A2
H	A2	A2	A2	A2	A2	A2
R	2	C	2			

	A	3								
	2	3	4	5	6	7	8	9	10	11
A	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
B	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
C	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
D	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
E	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
F	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
G	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
H	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
R	3	C	1						P	33

	A	3				
	2	3	4	5	6	7
A	A3	A3	A3	A3	A3	A3
B	A3	A3	A3	A3	A3	A3
C	A3	A3	A3	A3	A3	A3
D	A3	A3	A3	A3	A3	A3
E	A3	A3	A3	A3	A3	A3
F	A3	A3	A3	A3	A3	A3
G	A3	A3	A3	A3	A3	A3
H	A3	A3	A3	A3	A3	A3
R	3	C	2			

	A	4								
	2	3	4	5	6	7	8	9	10	11
A	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
B	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
C	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
D	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
E	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
F	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
G	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
H	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
R	4	C	1						P	49

	A	4				
	2	3	4	5	6	7
A	A4	A4	A4	A4	A4	A4
B	A4	A4	A4	A4	A4	A4
C	A4	A4	A4	A4	A4	A4
D	A4	A4	A4	A4	A4	A4
E	A4	A4	A4	A4	A4	A4
F	A4	A4	A4	A4	A4	A4
G	A4	A4	A4	A4	A4	A4
H	A4	A4	A4	A4	A4	A4
R	4	C	2			

BB1

	A	5								
	2	3	4	5	6	7	8	9	10	11
A	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5
B	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5
C	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5
D	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5
E	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5
F	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5
G	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5
H	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5
R	5	C	1						P	65

	A	5				
	2	3	4	5	6	7
A	A5	A5	A5	A5	A5	A5
B	A5	A5	A5	A5	A5	A5
C	A5	A5	A5	A5	A5	A5
D	A5	A5	A5	A5	A5	A5
E	A5	A5	A5	A5	A5	A5
F	A5	A5	A5	A5	A5	A5
G	A5	A5	A5	A5	A5	A5
H	A5	A5	A5	A5	A5	A5
R	5	C	2			

	A	6								
	2	3	4	5	6	7	8	9	10	11
A	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6
B	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6
C	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6
D	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6
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F	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6
G	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6
H	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6
R	6	C	1						P	81

	A	6				
	2	3	4	5	6	7
A	A6	A6	A6	A6	A6	A6
B	A6	A6	A6	A6	A6	A6
C	A6	A6	A6	A6	A6	A6
D	A6	A6	A6	A6	A6	A6
E	A6	A6	A6	A6	A6	A6
F	A6	A6	A6	A6	A6	A6
G	A6	A6	A6	A6	A6	A6
H	A6	A6	A6	A6	A6	A6
R	6	C	2			

	A	7								
	2	3	4	5	6	7	8	9	10	11
A	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7
B	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7
C	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7
D	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7
E	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7
F	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7
G	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7
H	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7
R	7	C	1						P	97

	A	7				
	2	3	4	5	6	7
A	A7	A7	A7	A7	A7	A7
B	A7	A7	A7	A7	A7	A7
C	A7	A7	A7	A7	A7	A7
D	A7	A7	A7	A7	A7	A7
E	A7	A7	A7	A7	A7	A7
F	A7	A7	A7	A7	A7	A7
G	A7	A7	A7	A7	A7	A7
H	A7	A7	A7	A7	A7	A7
R	7	C	2			

	A	8								
	2	3	4	5	6	7	8	9	10	11
A	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8
B	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8
C	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8
D	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8
E	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8
F	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8
G	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8
H	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8
R	8	C	1						P	113

	A	8				
	2	3	4	5	6	7
A	A8	A8	A8	A8	A8	A8
B	A8	A8	A8	A8	A8	A8
C	A8	A8	A8	A8	A8	A8
D	A8	A8	A8	A8	A8	A8
E	A8	A8	A8	A8	A8	A8
F	A8	A8	A8	A8	A8	A8
G	A8	A8	A8	A8	A8	A8
H	A8	A8	A8	A8	A8	A8
R	8	C	2			

						A	1												A
8	9	10	11			2	3	4	5	6	7	8	9	10	11				2
A1	A1	A1	A1		A	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1		A		A1
A1	A1	A1	A1		B	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1		B		A1
A1	A1	A1	A1		C	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1		C		A1
A1	A1	A1	A1		D	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1		D		A1
A1	A1	A1	A1		E	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1		E		A1
A1	A1	A1	A1		F	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1		F		A1
A1	A1	A1	A1		G	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1		G		A1
A1	A1	A1	A1		H	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1		H		A1
		P	2		R	1	C	3						P	3		R		1
						A	2												A
8	9	10	11			2	3	4	5	6	7	8	9	10	11				2
A2	A2	A2	A2		A	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2		A		A2
A2	A2	A2	A2		B	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2		B		A2
A2	A2	A2	A2		C	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2		C		A2
A2	A2	A2	A2		D	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2		D		A2
A2	A2	A2	A2		E	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2		E		A2
A2	A2	A2	A2		F	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2		F		A2
A2	A2	A2	A2		G	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2		G		A2
A2	A2	A2	A2		H	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2		H		A2
		P	18		R	2	C	3						P	19		R		2
						A	3												A
8	9	10	11			2	3	4	5	6	7	8	9	10	11				2
A3	A3	A3	A3		A	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3		A		A3
A3	A3	A3	A3		B	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3		B		A3
A3	A3	A3	A3		C	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3		C		A3
A3	A3	A3	A3		D	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3		D		A3
A3	A3	A3	A3		E	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3		E		A3
A3	A3	A3	A3		F	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3		F		A3
A3	A3	A3	A3		G	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3		G		A3
A3	A3	A3	A3		H	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3		H		A3
		P	34		R	3	C	3						P	35		R		3
						A	4												A
8	9	10	11			2	3	4	5	6	7	8	9	10	11				2
A4	A4	A4	A4		A	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4		A		A4
A4	A4	A4	A4		B	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4		B		A4
A4	A4	A4	A4		C	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4		C		A4
A4	A4	A4	A4		D	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4		D		A4
A4	A4	A4	A4		E	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4		E		A4
A4	A4	A4	A4		F	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4		F		A4
A4	A4	A4	A4		G	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4		G		A4
A4	A4	A4	A4		H	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4		H		A4
		P	50		R	4	C	3						P	51		R		4

BB1

						A	5											A
8	9	10	11			2	3	4	5	6	7	8	9	10	11			2
A5	A5	A5	A5		A	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		A	A5
A5	A5	A5	A5		B	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		B	A5
A5	A5	A5	A5		C	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		C	A5
A5	A5	A5	A5		D	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		D	A5
A5	A5	A5	A5		E	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		E	A5
A5	A5	A5	A5		F	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		F	A5
A5	A5	A5	A5		G	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		G	A5
A5	A5	A5	A5		H	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		H	A5
		P	66		R	5	C	3						P	67		R	5
						A	6											A
8	9	10	11			2	3	4	5	6	7	8	9	10	11			2
A6	A6	A6	A6		A	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		A	A6
A6	A6	A6	A6		B	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		B	A6
A6	A6	A6	A6		C	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		C	A6
A6	A6	A6	A6		D	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		D	A6
A6	A6	A6	A6		E	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		E	A6
A6	A6	A6	A6		F	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		F	A6
A6	A6	A6	A6		G	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		G	A6
A6	A6	A6	A6		H	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		H	A6
		P	82		R	6	C	3						P	83		R	6
						A	7											A
8	9	10	11			2	3	4	5	6	7	8	9	10	11			2
A7	A7	A7	A7		A	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		A	A7
A7	A7	A7	A7		B	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		B	A7
A7	A7	A7	A7		C	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		C	A7
A7	A7	A7	A7		D	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		D	A7
A7	A7	A7	A7		E	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		E	A7
A7	A7	A7	A7		F	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		F	A7
A7	A7	A7	A7		G	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		G	A7
A7	A7	A7	A7		H	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		H	A7
		P	98		R	7	C	3						P	99		R	7
						A	8											A
8	9	10	11			2	3	4	5	6	7	8	9	10	11			2
A8	A8	A8	A8		A	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		A	A8
A8	A8	A8	A8		B	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		B	A8
A8	A8	A8	A8		C	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		C	A8
A8	A8	A8	A8		D	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		D	A8
A8	A8	A8	A8		E	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		E	A8
A8	A8	A8	A8		F	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		F	A8
A8	A8	A8	A8		G	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		G	A8
A8	A8	A8	A8		H	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		H	A8
		P	114		R	8	C	3						P	115		R	8

BB1

1								
3	4	5	6	7	8	9	10	11
A1	A1	A1	A1	A1	A1	A1	A1	A1
A1	A1	A1	A1	A1	A1	A1	A1	A1
A1	A1	A1	A1	A1	A1	A1	A1	A1
A1	A1	A1	A1	A1	A1	A1	A1	A1
A1	A1	A1	A1	A1	A1	A1	A1	A1
A1	A1	A1	A1	A1	A1	A1	A1	A1
A1	A1	A1	A1	A1	A1	A1	A1	A1
A1	A1	A1	A1	A1	A1	A1	A1	A1
C	4						P	4

	A	1						
	2	3	4	5	6	7	8	9
A	A1	A1	A1	A1	A1	A1	A1	A1
B	A1	A1	A1	A1	A1	A1	A1	A1
C	A1	A1	A1	A1	A1	A1	A1	A1
D	A1	A1	A1	A1	A1	A1	A1	A1
E	A1	A1	A1	A1	A1	A1	A1	A1
F	A1	A1	A1	A1	A1	A1	A1	A1
G	A1	A1	A1	A1	A1	A1	A1	A1
H	A1	A1	A1	A1	A1	A1	A1	A1
R	1	C	5					

2								
3	4	5	6	7	8	9	10	11
A2	A2	A2	A2	A2	A2	A2	A2	A2
A2	A2	A2	A2	A2	A2	A2	A2	A2
A2	A2	A2	A2	A2	A2	A2	A2	A2
A2	A2	A2	A2	A2	A2	A2	A2	A2
A2	A2	A2	A2	A2	A2	A2	A2	A2
A2	A2	A2	A2	A2	A2	A2	A2	A2
A2	A2	A2	A2	A2	A2	A2	A2	A2
A2	A2	A2	A2	A2	A2	A2	A2	A2
C	4						P	20

	A	2						
	2	3	4	5	6	7	8	9
A	A2	A2	A2	A2	A2	A2	A2	A2
B	A2	A2	A2	A2	A2	A2	A2	A2
C	A2	A2	A2	A2	A2	A2	A2	A2
D	A2	A2	A2	A2	A2	A2	A2	A2
E	A2	A2	A2	A2	A2	A2	A2	A2
F	A2	A2	A2	A2	A2	A2	A2	A2
G	A2	A2	A2	A2	A2	A2	A2	A2
H	A2	A2	A2	A2	A2	A2	A2	A2
R	2	C	5					

3								
3	4	5	6	7	8	9	10	11
A3	A3	A3	A3	A3	A3	A3	A3	A3
A3	A3	A3	A3	A3	A3	A3	A3	A3
A3	A3	A3	A3	A3	A3	A3	A3	A3
A3	A3	A3	A3	A3	A3	A3	A3	A3
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A3	A3	A3	A3	A3	A3	A3	A3	A3
A3	A3	A3	A3	A3	A3	A3	A3	A3
C	4						P	36

	A	3						
	2	3	4	5	6	7	8	9
A	A3	A3	A3	A3	A3	A3	A3	A3
B	A3	A3	A3	A3	A3	A3	A3	A3
C	A3	A3	A3	A3	A3	A3	A3	A3
D	A3	A3	A3	A3	A3	A3	A3	A3
E	A3	A3	A3	A3	A3	A3	A3	A3
F	A3	A3	A3	A3	A3	A3	A3	A3
G	A3	A3	A3	A3	A3	A3	A3	A3
H	A3	A3	A3	A3	A3	A3	A3	A3
R	3	C	5					

4								
3	4	5	6	7	8	9	10	11
A4	A4	A4	A4	A4	A4	A4	A4	A4
A4	A4	A4	A4	A4	A4	A4	A4	A4
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A4	A4	A4	A4	A4	A4	A4	A4	A4
C	4						P	52

	A	4						
	2	3	4	5	6	7	8	9
A	A4	A4	A4	A4	A4	A4	A4	A4
B	A4	A4	A4	A4	A4	A4	A4	A4
C	A4	A4	A4	A4	A4	A4	A4	A4
D	A4	A4	A4	A4	A4	A4	A4	A4
E	A4	A4	A4	A4	A4	A4	A4	A4
F	A4	A4	A4	A4	A4	A4	A4	A4
G	A4	A4	A4	A4	A4	A4	A4	A4
H	A4	A4	A4	A4	A4	A4	A4	A4
R	4	C	5					

BB1

5											A	5						
3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8	9
A5	A5	A5	A5	A5	A5	A5	A5	A5		A	A5	A5	A5	A5	A5	A5	A5	A5
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A5	A5	A5	A5	A5	A5	A5	A5	A5		D	A5	A5	A5	A5	A5	A5	A5	A5
A5	A5	A5	A5	A5	A5	A5	A5	A5		E	A5	A5	A5	A5	A5	A5	A5	A5
A5	A5	A5	A5	A5	A5	A5	A5	A5		F	A5	A5	A5	A5	A5	A5	A5	A5
A5	A5	A5	A5	A5	A5	A5	A5	A5		G	A5	A5	A5	A5	A5	A5	A5	A5
A5	A5	A5	A5	A5	A5	A5	A5	A5		H	A5	A5	A5	A5	A5	A5	A5	A5
C	4						P	68		R	5	C	5					
6											A	6						
3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8	9
A6	A6	A6	A6	A6	A6	A6	A6	A6		A	A6	A6	A6	A6	A6	A6	A6	A6
A6	A6	A6	A6	A6	A6	A6	A6	A6		B	A6	A6	A6	A6	A6	A6	A6	A6
A6	A6	A6	A6	A6	A6	A6	A6	A6		C	A6	A6	A6	A6	A6	A6	A6	A6
A6	A6	A6	A6	A6	A6	A6	A6	A6		D	A6	A6	A6	A6	A6	A6	A6	A6
A6	A6	A6	A6	A6	A6	A6	A6	A6		E	A6	A6	A6	A6	A6	A6	A6	A6
A6	A6	A6	A6	A6	A6	A6	A6	A6		F	A6	A6	A6	A6	A6	A6	A6	A6
A6	A6	A6	A6	A6	A6	A6	A6	A6		G	A6	A6	A6	A6	A6	A6	A6	A6
A6	A6	A6	A6	A6	A6	A6	A6	A6		H	A6	A6	A6	A6	A6	A6	A6	A6
C	4						P	84		R	6	C	5					
7											A	7						
3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8	9
A7	A7	A7	A7	A7	A7	A7	A7	A7		A	A7	A7	A7	A7	A7	A7	A7	A7
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A7	A7	A7	A7	A7	A7	A7	A7	A7		G	A7	A7	A7	A7	A7	A7	A7	A7
A7	A7	A7	A7	A7	A7	A7	A7	A7		H	A7	A7	A7	A7	A7	A7	A7	A7
C	4						P	100		R	7	C	5					
8											A	8						
3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8	9
A8	A8	A8	A8	A8	A8	A8	A8	A8		A	A8	A8	A8	A8	A8	A8	A8	A8
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C	4						P	116		R	8	C	5					

BB1

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A1	A1		H	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1		H	A1	A1	A1
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P	21		R	2	C	6						P	22		R	2	C	7
				A	3											A	3	
10	11			2	3	4	5	6	7	8	9	10	11			2	3	4
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A3	A3		H	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3		H	A3	A3	A3
P	37		R	3	C	6						P	38		R	3	C	7
				A	4											A	4	
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A4	A4		H	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4		H	A4	A4	A4
P	53		R	4	C	6						P	54		R	4	C	7

				A	5											A	5		
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A5	A5		C	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		C	A5	A5	A5	
A5	A5		D	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		D	A5	A5	A5	
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A5	A5		G	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		G	A5	A5	A5	
A5	A5		H	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		H	A5	A5	A5	
P	69		R	5	C	6						P	70		R	5	C	7	
				A	6											A	6		
10	11			2	3	4	5	6	7	8	9	10	11			2	3	4	
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A6	A6		G	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		G	A6	A6	A6	
A6	A6		H	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		H	A6	A6	A6	
P	85		R	6	C	6						P	86		R	6	C	7	
				A	7											A	7		
10	11			2	3	4	5	6	7	8	9	10	11			2	3	4	
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A7	A7		D	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		D	A7	A7	A7	
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A7	A7		G	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		G	A7	A7	A7	
A7	A7		H	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		H	A7	A7	A7	
P	101		R	7	C	6						P	102		R	7	C	7	
				A	8											A	8		
10	11			2	3	4	5	6	7	8	9	10	11			2	3	4	
A8	A8		A	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		A	A8	A8	A8	
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A8	A8		G	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		G	A8	A8	A8	
A8	A8		H	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		H	A8	A8	A8	
P	117		R	8	C	6						P	118		R	8	C	7	

5	6	7	8	9	10	11
A1	A1	A1	A1	A1	A1	A1
A1	A1	A1	A1	A1	A1	A1
A1	A1	A1	A1	A1	A1	A1
A1	A1	A1	A1	A1	A1	A1
A1	A1	A1	A1	A1	A1	A1
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A1	A1	A1	A1	A1	A1	A1
A1	A1	A1	A1	A1	A1	A1
					P	7

	A	1								
	2	3	4	5	6	7	8	9	10	11
A	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
B	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
C	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
D	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
E	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
F	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
G	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
H	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
R	1	C	8						P	8

5	6	7	8	9	10	11
A2	A2	A2	A2	A2	A2	A2
A2	A2	A2	A2	A2	A2	A2
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A2	A2	A2	A2	A2	A2	A2
A2	A2	A2	A2	A2	A2	A2
A2	A2	A2	A2	A2	A2	A2
A2	A2	A2	A2	A2	A2	A2
A2	A2	A2	A2	A2	A2	A2
					P	23

	A	2								
	2	3	4	5	6	7	8	9	10	11
A	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
B	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
C	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
D	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
E	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
F	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
G	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
H	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
R	2	C	8						P	24

5	6	7	8	9	10	11
A3	A3	A3	A3	A3	A3	A3
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A3	A3	A3	A3	A3	A3	A3
					P	39

	A	3								
	2	3	4	5	6	7	8	9	10	11
A	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
B	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
C	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
D	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
E	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
F	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
G	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
H	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
R	3	C	8						P	40

5	6	7	8	9	10	11
A4	A4	A4	A4	A4	A4	A4
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A4	A4	A4	A4	A4	A4	A4
					P	55

	A	4								
	2	3	4	5	6	7	8	9	10	11
A	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
B	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
C	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
D	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
E	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
F	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
G	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
H	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
R	4	C	8						P	56

5	6	7	8	9	10	11
A5	A5	A5	A5	A5	A5	A5
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					P	71

								A	5						
								2	3	4	5	6	7	8	9	10	11
A	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5
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C	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5
D	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5
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H	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5
R	5	C	8												P	72	

5	6	7	8	9	10	11
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A6	A6	A6	A6	A6	A6	A6
A6	A6	A6	A6	A6	A6	A6
					P	87

								A	6						
								2	3	4	5	6	7	8	9	10	11
A	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6
B	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6
C	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6
D	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6
E	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6
F	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6
G	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6
H	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6
R	6	C	8												P	88	

5	6	7	8	9	10	11
A7	A7	A7	A7	A7	A7	A7
A7	A7	A7	A7	A7	A7	A7
A7	A7	A7	A7	A7	A7	A7
A7	A7	A7	A7	A7	A7	A7
A7	A7	A7	A7	A7	A7	A7
A7	A7	A7	A7	A7	A7	A7
A7	A7	A7	A7	A7	A7	A7
A7	A7	A7	A7	A7	A7	A7
					P	103

								A	7						
								2	3	4	5	6	7	8	9	10	11
A	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7
B	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7
C	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7
D	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7
E	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7
F	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7
G	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7
H	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7
R	7	C	8												P	104	

5	6	7	8	9	10	11
A8	A8	A8	A8	A8	A8	A8
A8	A8	A8	A8	A8	A8	A8
A8	A8	A8	A8	A8	A8	A8
A8	A8	A8	A8	A8	A8	A8
A8	A8	A8	A8	A8	A8	A8
A8	A8	A8	A8	A8	A8	A8
A8	A8	A8	A8	A8	A8	A8
A8	A8	A8	A8	A8	A8	A8
					P	119

								A	8						
								2	3	4	5	6	7	8	9	10	11
A	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8
B	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8
C	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8
D	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8
E	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8
F	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8
G	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8
H	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8
R	8	C	8												P	120	

BB1

	A	1								
	2	3	4	5	6	7	8	9	10	11
A	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
B	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
C	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
D	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
E	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
F	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
G	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
H	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
R	1	C	9						P	9

	A	1			
	2	3	4	5	6
A	A1	A1	A1	A1	A1
B	A1	A1	A1	A1	A1
C	A1	A1	A1	A1	A1
D	A1	A1	A1	A1	A1
E	A1	A1	A1	A1	A1
F	A1	A1	A1	A1	A1
G	A1	A1	A1	A1	A1
H	A1	A1	A1	A1	A1
R	1	C	10		

	A	2								
	2	3	4	5	6	7	8	9	10	11
A	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
B	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
C	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
D	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
E	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
F	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
G	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
H	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
R	2	C	9						P	25

	A	2			
	2	3	4	5	6
A	A2	A2	A2	A2	A2
B	A2	A2	A2	A2	A2
C	A2	A2	A2	A2	A2
D	A2	A2	A2	A2	A2
E	A2	A2	A2	A2	A2
F	A2	A2	A2	A2	A2
G	A2	A2	A2	A2	A2
H	A2	A2	A2	A2	A2
R	2	C	10		

	A	3								
	2	3	4	5	6	7	8	9	10	11
A	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
B	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
C	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
D	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
E	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
F	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
G	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
H	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
R	3	C	9						P	41

	A	3			
	2	3	4	5	6
A	A3	A3	A3	A3	A3
B	A3	A3	A3	A3	A3
C	A3	A3	A3	A3	A3
D	A3	A3	A3	A3	A3
E	A3	A3	A3	A3	A3
F	A3	A3	A3	A3	A3
G	A3	A3	A3	A3	A3
H	A3	A3	A3	A3	A3
R	3	C	10		

	A	4								
	2	3	4	5	6	7	8	9	10	11
A	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
B	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
C	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
D	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
E	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
F	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
G	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
H	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
R	4	C	9						P	57

	A	4			
	2	3	4	5	6
A	A4	A4	A4	A4	A4
B	A4	A4	A4	A4	A4
C	A4	A4	A4	A4	A4
D	A4	A4	A4	A4	A4
E	A4	A4	A4	A4	A4
F	A4	A4	A4	A4	A4
G	A4	A4	A4	A4	A4
H	A4	A4	A4	A4	A4
R	4	C	10		

BB1

		A	5											A	5				
		2	3	4	5	6	7	8	9	10	11			2	3	4	5	6
	A	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		A	A5	A5	A5	A5	A5
	B	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		B	A5	A5	A5	A5	A5
	C	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		C	A5	A5	A5	A5	A5
	D	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		D	A5	A5	A5	A5	A5
	E	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		E	A5	A5	A5	A5	A5
	F	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		F	A5	A5	A5	A5	A5
	G	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		G	A5	A5	A5	A5	A5
	H	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		H	A5	A5	A5	A5	A5
	R	5	C	9						P	73		R	5	C	10		
		A	6											A	6				
		2	3	4	5	6	7	8	9	10	11			2	3	4	5	6
	A	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		A	A6	A6	A6	A6	A6
	B	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		B	A6	A6	A6	A6	A6
	C	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		C	A6	A6	A6	A6	A6
	D	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		D	A6	A6	A6	A6	A6
	E	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		E	A6	A6	A6	A6	A6
	F	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		F	A6	A6	A6	A6	A6
	G	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		G	A6	A6	A6	A6	A6
	H	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		H	A6	A6	A6	A6	A6
	R	6	C	9						P	89		R	6	C	10		
		A	7											A	7				
		2	3	4	5	6	7	8	9	10	11			2	3	4	5	6
	A	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		A	A7	A7	A7	A7	A7
	B	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		B	A7	A7	A7	A7	A7
	C	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		C	A7	A7	A7	A7	A7
	D	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		D	A7	A7	A7	A7	A7
	E	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		E	A7	A7	A7	A7	A7
	F	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		F	A7	A7	A7	A7	A7
	G	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		G	A7	A7	A7	A7	A7
	H	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		H	A7	A7	A7	A7	A7
	R	7	C	9						P	105		R	7	C	10		
		A	8											A	8				
		2	3	4	5	6	7	8	9	10	11			2	3	4	5	6
	A	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		A	A8	A8	A8	A8	A8
	B	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		B	A8	A8	A8	A8	A8
	C	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		C	A8	A8	A8	A8	A8
	D	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		D	A8	A8	A8	A8	A8
	E	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		E	A8	A8	A8	A8	A8
	F	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		F	A8	A8	A8	A8	A8
	G	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		G	A8	A8	A8	A8	A8
	H	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		H	A8	A8	A8	A8	A8
	R	8	C	9						P	121		R	8	C	10		

								A	1													
7	8	9	10	11				2	3	4	5	6	7	8	9	10	11			
A1	A1	A1	A1	A1			A	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1			A
A1	A1	A1	A1	A1			B	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1			B
A1	A1	A1	A1	A1			C	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1			C
A1	A1	A1	A1	A1			D	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1			D
A1	A1	A1	A1	A1			E	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1			E
A1	A1	A1	A1	A1			F	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1			F
A1	A1	A1	A1	A1			G	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1			G
A1	A1	A1	A1	A1			H	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1			H
			P	10			R	1	C	11						P	11			R
								A	2											
7	8	9	10	11				2	3	4	5	6	7	8	9	10	11			
A2	A2	A2	A2	A2			A	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2			A
A2	A2	A2	A2	A2			B	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2			B
A2	A2	A2	A2	A2			C	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2			C
A2	A2	A2	A2	A2			D	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2			D
A2	A2	A2	A2	A2			E	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2			E
A2	A2	A2	A2	A2			F	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2			F
A2	A2	A2	A2	A2			G	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2			G
A2	A2	A2	A2	A2			H	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2			H
			P	26			R	2	C	11						P	27			R
								A	3											
7	8	9	10	11				2	3	4	5	6	7	8	9	10	11			
A3	A3	A3	A3	A3			A	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3			A
A3	A3	A3	A3	A3			B	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3			B
A3	A3	A3	A3	A3			C	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3			C
A3	A3	A3	A3	A3			D	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3			D
A3	A3	A3	A3	A3			E	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3			E
A3	A3	A3	A3	A3			F	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3			F
A3	A3	A3	A3	A3			G	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3			G
A3	A3	A3	A3	A3			H	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3			H
			P	42			R	3	C	11						P	43			R
								A	4											
7	8	9	10	11				2	3	4	5	6	7	8	9	10	11			
A4	A4	A4	A4	A4			A	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4			A
A4	A4	A4	A4	A4			B	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4			B
A4	A4	A4	A4	A4			C	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4			C
A4	A4	A4	A4	A4			D	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4			D
A4	A4	A4	A4	A4			E	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4			E
A4	A4	A4	A4	A4			F	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4			F
A4	A4	A4	A4	A4			G	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4			G
A4	A4	A4	A4	A4			H	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4			H
			P	58			R	4	C	11						P	59			R

								A	5								
7	8	9	10	11			2	3	4	5	6	7	8	9	10	11	
A5	A5	A5	A5	A5		A	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		A
A5	A5	A5	A5	A5		B	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		B
A5	A5	A5	A5	A5		C	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		C
A5	A5	A5	A5	A5		D	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		D
A5	A5	A5	A5	A5		E	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		E
A5	A5	A5	A5	A5		F	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		F
A5	A5	A5	A5	A5		G	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		G
A5	A5	A5	A5	A5		H	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5		H
			P	74		R	5	C	11						P	75		R
								A	6								
7	8	9	10	11			2	3	4	5	6	7	8	9	10	11	
A6	A6	A6	A6	A6		A	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		A
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			P	90		R	6	C	11						P	91		R
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			P	106		R	7	C	11						P	107		R
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			P	122		R	8	C	11						P	123		R

BB1

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1	C	12						P	12

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C	A1	A1	A1	A1	A1	A1	A1
D	A1	A1	A1	A1	A1	A1	A1
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R	1	C	13				

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2	C	12						P	28

	A	2					
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B	A2	A2	A2	A2	A2	A2	A2
C	A2	A2	A2	A2	A2	A2	A2
D	A2	A2	A2	A2	A2	A2	A2
E	A2	A2	A2	A2	A2	A2	A2
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G	A2	A2	A2	A2	A2	A2	A2
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R	2	C	13				

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3	C	12						P	44

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R	3	C	13				

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4	C	12						P	60

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G	A4	A4	A4	A4	A4	A4	A4
H	A4	A4	A4	A4	A4	A4	A4
R	4	C	13				

BB1

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5	C	12						P	76		R	5	C	13				
A	6											A	6					
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6	C	12						P	92		R	6	C	13				
A	7											A	7					
2	3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8
A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		A	A7	A7	A7	A7	A7	A7	A7
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7	C	12						P	108		R	7	C	13				
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8	C	12						P	124		R	8	C	13				

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	P	13		R	1	C	14						P	14		R	1	C
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	P	29		R	2	C	14						P	30		R	2	C
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	P	45		R	3	C	14						P	46		R	3	C
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	P	61		R	4	C	14						P	62		R	4	C

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	P	77		R	5	C	14						P	78		R	5	C
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A6	A6	A6		F	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		F	A6	A6
A6	A6	A6		G	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		G	A6	A6
A6	A6	A6		H	A6	A6	A6	A6	A6	A6	A6	A6	A6	A6		H	A6	A6
	P	93		R	6	C	14						P	94		R	6	C
					A	7											A	7
9	10	11			2	3	4	5	6	7	8	9	10	11			2	3
A7	A7	A7		A	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		A	A7	A7
A7	A7	A7		B	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		B	A7	A7
A7	A7	A7		C	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		C	A7	A7
A7	A7	A7		D	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		D	A7	A7
A7	A7	A7		E	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		E	A7	A7
A7	A7	A7		F	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		F	A7	A7
A7	A7	A7		G	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		G	A7	A7
A7	A7	A7		H	A7	A7	A7	A7	A7	A7	A7	A7	A7	A7		H	A7	A7
	P	109		R	7	C	14						P	110		R	7	C
					A	8											A	8
9	10	11			2	3	4	5	6	7	8	9	10	11			2	3
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A8	A8	A8		H	A8	A8	A8	A8	A8	A8	A8	A8	A8	A8		H	A8	A8
	P	125		R	8	C	14						P	126		R	8	C

BB1

4	5	6	7	8	9	10	11
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A1	A1	A1	A1	A1	A1	A1	A1
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A1	A1	A1	A1	A1	A1	A1	A1
15						P	15

	A	1							
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A	A1	A1	A1	A1	A1	A1	A1	A1	A1
B	A1	A1	A1	A1	A1	A1	A1	A1	A1
C	A1	A1	A1	A1	A1	A1	A1	A1	A1
D	A1	A1	A1	A1	A1	A1	A1	A1	A1
E	A1	A1	A1	A1	A1	A1	A1	A1	A1
F	A1	A1	A1	A1	A1	A1	A1	A1	A1
G	A1	A1	A1	A1	A1	A1	A1	A1	A1
H	A1	A1	A1	A1	A1	A1	A1	A1	A1
R	1	C	16						P

4	5	6	7	8	9	10	11
A2	A2	A2	A2	A2	A2	A2	A2
A2	A2	A2	A2	A2	A2	A2	A2
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A2	A2	A2	A2	A2	A2	A2	A2
A2	A2	A2	A2	A2	A2	A2	A2
A2	A2	A2	A2	A2	A2	A2	A2
A2	A2	A2	A2	A2	A2	A2	A2
15						P	31

	A	2							
	2	3	4	5	6	7	8	9	10
A	A2	A2	A2	A2	A2	A2	A2	A2	A2
B	A2	A2	A2	A2	A2	A2	A2	A2	A2
C	A2	A2	A2	A2	A2	A2	A2	A2	A2
D	A2	A2	A2	A2	A2	A2	A2	A2	A2
E	A2	A2	A2	A2	A2	A2	A2	A2	A2
F	A2	A2	A2	A2	A2	A2	A2	A2	A2
G	A2	A2	A2	A2	A2	A2	A2	A2	A2
H	A2	A2	A2	A2	A2	A2	A2	A2	A2
R	2	C	16						P

4	5	6	7	8	9	10	11
A3	A3	A3	A3	A3	A3	A3	A3
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15						P	47

	A	3							
	2	3	4	5	6	7	8	9	10
A	A3	A3	A3	A3	A3	A3	A3	A3	A3
B	A3	A3	A3	A3	A3	A3	A3	A3	A3
C	A3	A3	A3	A3	A3	A3	A3	A3	A3
D	A3	A3	A3	A3	A3	A3	A3	A3	A3
E	A3	A3	A3	A3	A3	A3	A3	A3	A3
F	A3	A3	A3	A3	A3	A3	A3	A3	A3
G	A3	A3	A3	A3	A3	A3	A3	A3	A3
H	A3	A3	A3	A3	A3	A3	A3	A3	A3
R	3	C	16						P

4	5	6	7	8	9	10	11
A4	A4	A4	A4	A4	A4	A4	A4
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15						P	63

	A	4							
	2	3	4	5	6	7	8	9	10
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R	4	C	16						P

4	5	6	7	8	9	10	11
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15						P	79

	A	5						
	2	3	4	5	6	7	8	9	10
A	A5	A5	A5	A5	A5	A5	A5	A5	A5
B	A5	A5	A5	A5	A5	A5	A5	A5	A5
C	A5	A5	A5	A5	A5	A5	A5	A5	A5
D	A5	A5	A5	A5	A5	A5	A5	A5	A5
E	A5	A5	A5	A5	A5	A5	A5	A5	A5
F	A5	A5	A5	A5	A5	A5	A5	A5	A5
G	A5	A5	A5	A5	A5	A5	A5	A5	A5
H	A5	A5	A5	A5	A5	A5	A5	A5	A5
R	5	C	16						P

4	5	6	7	8	9	10	11
A6	A6	A6	A6	A6	A6	A6	A6
A6	A6	A6	A6	A6	A6	A6	A6
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A6	A6	A6	A6	A6	A6	A6	A6
15						P	95

	A	6						
	2	3	4	5	6	7	8	9	10
A	A6	A6	A6	A6	A6	A6	A6	A6	A6
B	A6	A6	A6	A6	A6	A6	A6	A6	A6
C	A6	A6	A6	A6	A6	A6	A6	A6	A6
D	A6	A6	A6	A6	A6	A6	A6	A6	A6
E	A6	A6	A6	A6	A6	A6	A6	A6	A6
F	A6	A6	A6	A6	A6	A6	A6	A6	A6
G	A6	A6	A6	A6	A6	A6	A6	A6	A6
H	A6	A6	A6	A6	A6	A6	A6	A6	A6
R	6	C	16						P

4	5	6	7	8	9	10	11
A7	A7	A7	A7	A7	A7	A7	A7
A7	A7	A7	A7	A7	A7	A7	A7
A7	A7	A7	A7	A7	A7	A7	A7
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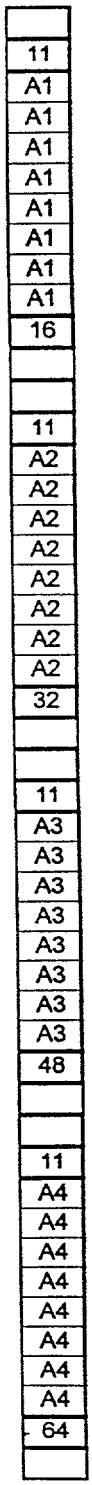
A7	A7	A7	A7	A7	A7	A7	A7
A7	A7	A7	A7	A7	A7	A7	A7
A7	A7	A7	A7	A7	A7	A7	A7
15						P	111

	A	7						
	2	3	4	5	6	7	8	9	10
A	A7	A7	A7	A7	A7	A7	A7	A7	A7
B	A7	A7	A7	A7	A7	A7	A7	A7	A7
C	A7	A7	A7	A7	A7	A7	A7	A7	A7
D	A7	A7	A7	A7	A7	A7	A7	A7	A7
E	A7	A7	A7	A7	A7	A7	A7	A7	A7
F	A7	A7	A7	A7	A7	A7	A7	A7	A7
G	A7	A7	A7	A7	A7	A7	A7	A7	A7
H	A7	A7	A7	A7	A7	A7	A7	A7	A7
R	7	C	16						P

4	5	6	7	8	9	10	11
A8	A8	A8	A8	A8	A8	A8	A8
A8	A8	A8	A8	A8	A8	A8	A8
A8	A8	A8	A8	A8	A8	A8	A8
A8	A8	A8	A8	A8	A8	A8	A8
A8	A8	A8	A8	A8	A8	A8	A8
A8	A8	A8	A8	A8	A8	A8	A8
A8	A8	A8	A8	A8	A8	A8	A8
A8	A8	A8	A8	A8	A8	A8	A8
15						P	127

	A	8						
	2	3	4	5	6	7	8	9	10
A	A8	A8	A8	A8	A8	A8	A8	A8	A8
B	A8	A8	A8	A8	A8	A8	A8	A8	A8
C	A8	A8	A8	A8	A8	A8	A8	A8	A8
D	A8	A8	A8	A8	A8	A8	A8	A8	A8
E	A8	A8	A8	A8	A8	A8	A8	A8	A8
F	A8	A8	A8	A8	A8	A8	A8	A8	A8
G	A8	A8	A8	A8	A8	A8	A8	A8	A8
H	A8	A8	A8	A8	A8	A8	A8	A8	A8
R	8	C	16						P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BB2

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	2	3	4	5	6	7	8	9	10	11			2	3	4	5	6	7
A	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		A	B3	B3	B3	B3	B3	B4
B	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		B	B3	B3	B3	B3	B3	B4
C	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		C	B3	B3	B3	B3	B3	B4
D	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		D	B3	B3	B3	B3	B3	B4
E	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		E	B3	B3	B3	B3	B3	B4
F	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		F	B3	B3	B3	B3	B3	B4
G	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		G	B3	B3	B3	B3	B3	B4
H	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		H	B3	B3	B3	B3	B3	B4
R	1	C	1						P	1		R	1	C	2			

	B	1				B	2						B	3				B
	2	3	4	5	6	7	8	9	10	11			2	3	4	5	6	7
A	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		A	B3	B3	B3	B3	B3	B4
B	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		B	B3	B3	B3	B3	B3	B4
C	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		C	B3	B3	B3	B3	B3	B4
D	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		D	B3	B3	B3	B3	B3	B4
E	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		E	B3	B3	B3	B3	B3	B4
F	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		F	B3	B3	B3	B3	B3	B4
G	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		G	B3	B3	B3	B3	B3	B4
H	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		H	B3	B3	B3	B3	B3	B4
R	2	C	1						P	17		R	2	C	2			

	B	1				B	2						B	3				B
	2	3	4	5	6	7	8	9	10	11			2	3	4	5	6	7
A	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		A	B3	B3	B3	B3	B3	B4
B	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		B	B3	B3	B3	B3	B3	B4
C	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		C	B3	B3	B3	B3	B3	B4
D	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		D	B3	B3	B3	B3	B3	B4
E	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		E	B3	B3	B3	B3	B3	B4
F	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		F	B3	B3	B3	B3	B3	B4
G	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		G	B3	B3	B3	B3	B3	B4
H	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		H	B3	B3	B3	B3	B3	B4
R	3	C	1						P	33		R	3	C	2			

	B	1				B	2						B	3				B
	2	3	4	5	6	7	8	9	10	11			2	3	4	5	6	7
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C	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		C	B3	B3	B3	B3	B3	B4
D	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		D	B3	B3	B3	B3	B3	B4
E	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		E	B3	B3	B3	B3	B3	B4
F	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		F	B3	B3	B3	B3	B3	B4
G	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		G	B3	B3	B3	B3	B3	B4
H	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2		H	B3	B3	B3	B3	B3	B4
R	4	C	1						P	49		R	4	C	2			

BB2

	B	1				B	2			
	2	3	4	5	6	7	8	9	10	11
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B	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
C	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
D	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
E	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
F	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
G	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
H	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
R	5	C	1						P	65

	B	3				B
	2	3	4	5	6	7
A	B3	B3	B3	B3	B3	B4
B	B3	B3	B3	B3	B3	B4
C	B3	B3	B3	B3	B3	B4
D	B3	B3	B3	B3	B3	B4
E	B3	B3	B3	B3	B3	B4
F	B3	B3	B3	B3	B3	B4
G	B3	B3	B3	B3	B3	B4
H	B3	B3	B3	B3	B3	B4
R	5	C	2			

	B	1				B	2			
	2	3	4	5	6	7	8	9	10	11
A	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
B	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
C	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
D	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
E	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
F	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
G	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
H	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
R	6	C	1						P	81

	B	3				B
	2	3	4	5	6	7
A	B3	B3	B3	B3	B3	B4
B	B3	B3	B3	B3	B3	B4
C	B3	B3	B3	B3	B3	B4
D	B3	B3	B3	B3	B3	B4
E	B3	B3	B3	B3	B3	B4
F	B3	B3	B3	B3	B3	B4
G	B3	B3	B3	B3	B3	B4
H	B3	B3	B3	B3	B3	B4
R	6	C	2			

	B	1				B	2			
	2	3	4	5	6	7	8	9	10	11
A	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
B	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
C	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
D	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
E	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
F	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
G	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
H	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
R	7	C	1						P	97

	B	3				B
	2	3	4	5	6	7
A	B3	B3	B3	B3	B3	B4
B	B3	B3	B3	B3	B3	B4
C	B3	B3	B3	B3	B3	B4
D	B3	B3	B3	B3	B3	B4
E	B3	B3	B3	B3	B3	B4
F	B3	B3	B3	B3	B3	B4
G	B3	B3	B3	B3	B3	B4
H	B3	B3	B3	B3	B3	B4
R	7	C	2			

	B	1				B	2			
	2	3	4	5	6	7	8	9	10	11
A	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
B	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
C	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
D	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
E	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
F	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
G	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
H	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2
R	8	C	1						P	113

	B	3				B
	2	3	4	5	6	7
A	B3	B3	B3	B3	B3	B4
B	B3	B3	B3	B3	B3	B4
C	B3	B3	B3	B3	B3	B4
D	B3	B3	B3	B3	B3	B4
E	B3	B3	B3	B3	B3	B4
F	B3	B3	B3	B3	B3	B4
G	B3	B3	B3	B3	B3	B4
H	B3	B3	B3	B3	B3	B4
R	8	C	2			

BB2

4						B	5				B	6						B
8	9	10	11			2	3	4	5	6	7	8	9	10	11			2
B4	B4	B4	B4		A	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		A	B7
B4	B4	B4	B4		B	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		B	B7
B4	B4	B4	B4		C	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		C	B7
B4	B4	B4	B4		D	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		D	B7
B4	B4	B4	B4		E	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		E	B7
B4	B4	B4	B4		F	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		F	B7
B4	B4	B4	B4		G	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		G	B7
B4	B4	B4	B4		H	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		H	B7
		P	2		R	1	C	3						P	3		R	1
4						B	5				B	6						B
8	9	10	11			2	3	4	5	6	7	8	9	10	11			2
B4	B4	B4	B4		A	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		A	B7
B4	B4	B4	B4		B	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		B	B7
B4	B4	B4	B4		C	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		C	B7
B4	B4	B4	B4		D	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		D	B7
B4	B4	B4	B4		E	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		E	B7
B4	B4	B4	B4		F	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		F	B7
B4	B4	B4	B4		G	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		G	B7
B4	B4	B4	B4		H	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		H	B7
		P	18		R	2	C	3						P	19		R	2
4						B	5				B	6						B
8	9	10	11			2	3	4	5	6	7	8	9	10	11			2
B4	B4	B4	B4		A	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		A	B7
B4	B4	B4	B4		B	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		B	B7
B4	B4	B4	B4		C	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		C	B7
B4	B4	B4	B4		D	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		D	B7
B4	B4	B4	B4		E	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		E	B7
B4	B4	B4	B4		F	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		F	B7
B4	B4	B4	B4		G	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		G	B7
B4	B4	B4	B4		H	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		H	B7
		P	34		R	3	C	3						P	35		R	3
4						B	5				B	6						B
8	9	10	11			2	3	4	5	6	7	8	9	10	11			2
B4	B4	B4	B4		A	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		A	B7
B4	B4	B4	B4		B	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		B	B7
B4	B4	B4	B4		C	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		C	B7
B4	B4	B4	B4		D	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		D	B7
B4	B4	B4	B4		E	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		E	B7
B4	B4	B4	B4		F	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		F	B7
B4	B4	B4	B4		G	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		G	B7
B4	B4	B4	B4		H	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6		H	B7
		P	50		R	4	C	3						P	51		R	4

4						B	5				B	6					B
8	9	10	11			2	3	4	5	6	7	8	9	10	11		2
B4	B4	B4	B4		A	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	A	B7
B4	B4	B4	B4		B	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	B	B7
B4	B4	B4	B4		C	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	C	B7
B4	B4	B4	B4		D	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	D	B7
B4	B4	B4	B4		E	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	E	B7
B4	B4	B4	B4		F	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	F	B7
B4	B4	B4	B4		G	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	G	B7
B4	B4	B4	B4		H	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	H	B7
		P	66		R	5	C	3						P	67	R	5
4						B	5				B	6					B
8	9	10	11			2	3	4	5	6	7	8	9	10	11		2
B4	B4	B4	B4		A	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	A	B7
B4	B4	B4	B4		B	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	B	B7
B4	B4	B4	B4		C	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	C	B7
B4	B4	B4	B4		D	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	D	B7
B4	B4	B4	B4		E	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	E	B7
B4	B4	B4	B4		F	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	F	B7
B4	B4	B4	B4		G	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	G	B7
B4	B4	B4	B4		H	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	H	B7
		P	82		R	6	C	3						P	83	R	6
4						B	5				B	6					B
8	9	10	11			2	3	4	5	6	7	8	9	10	11		2
B4	B4	B4	B4		A	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	A	B7
B4	B4	B4	B4		B	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	B	B7
B4	B4	B4	B4		C	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	C	B7
B4	B4	B4	B4		D	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	D	B7
B4	B4	B4	B4		E	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	E	B7
B4	B4	B4	B4		F	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	F	B7
B4	B4	B4	B4		G	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	G	B7
B4	B4	B4	B4		H	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	H	B7
		P	98		R	7	C	3						P	99	R	7
4						B	5				B	6					B
8	9	10	11			2	3	4	5	6	7	8	9	10	11		2
B4	B4	B4	B4		A	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	A	B7
B4	B4	B4	B4		B	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	B	B7
B4	B4	B4	B4		C	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	C	B7
B4	B4	B4	B4		D	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	D	B7
B4	B4	B4	B4		E	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	E	B7
B4	B4	B4	B4		F	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	F	B7
B4	B4	B4	B4		G	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	G	B7
B4	B4	B4	B4		H	B5	B5	B5	B5	B5	B6	B6	B6	B6	B6	H	B7
		P	114		R	8	C	3						P	115	R	8

BB2

7				B	8			
3	4	5	6	7	8	9	10	11
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
C	4						P	4

	B	9				B	10	
	2	3	4	5	6	7	8	9
A	B9	B9	B9	B9	B9	B10	B10	B10
B	B9	B9	B9	B9	B9	B10	B10	B10
C	B9	B9	B9	B9	B9	B10	B10	B10
D	B9	B9	B9	B9	B9	B10	B10	B10
E	B9	B9	B9	B9	B9	B10	B10	B10
F	B9	B9	B9	B9	B9	B10	B10	B10
G	B9	B9	B9	B9	B9	B10	B10	B10
H	B9	B9	B9	B9	B9	B10	B10	B10
R	1	C	5					

7				B	8			
3	4	5	6	7	8	9	10	11
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
C	4						P	20

	B	9				B	10	
	2	3	4	5	6	7	8	9
A	B9	B9	B9	B9	B9	B10	B10	B10
B	B9	B9	B9	B9	B9	B10	B10	B10
C	B9	B9	B9	B9	B9	B10	B10	B10
D	B9	B9	B9	B9	B9	B10	B10	B10
E	B9	B9	B9	B9	B9	B10	B10	B10
F	B9	B9	B9	B9	B9	B10	B10	B10
G	B9	B9	B9	B9	B9	B10	B10	B10
H	B9	B9	B9	B9	B9	B10	B10	B10
R	2	C	5					

7				B	8			
3	4	5	6	7	8	9	10	11
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
C	4						P	36

	B	9				B	10	
	2	3	4	5	6	7	8	9
A	B9	B9	B9	B9	B9	B10	B10	B10
B	B9	B9	B9	B9	B9	B10	B10	B10
C	B9	B9	B9	B9	B9	B10	B10	B10
D	B9	B9	B9	B9	B9	B10	B10	B10
E	B9	B9	B9	B9	B9	B10	B10	B10
F	B9	B9	B9	B9	B9	B10	B10	B10
G	B9	B9	B9	B9	B9	B10	B10	B10
H	B9	B9	B9	B9	B9	B10	B10	B10
R	3	C	5					

7				B	8			
3	4	5	6	7	8	9	10	11
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
B7	B7	B7	B7	B8	B8	B8	B8	B8
C	4						P	52

	B	9				B	10	
	2	3	4	5	6	7	8	9
A	B9	B9	B9	B9	B9	B10	B10	B10
B	B9	B9	B9	B9	B9	B10	B10	B10
C	B9	B9	B9	B9	B9	B10	B10	B10
D	B9	B9	B9	B9	B9	B10	B10	B10
E	B9	B9	B9	B9	B9	B10	B10	B10
F	B9	B9	B9	B9	B9	B10	B10	B10
G	B9	B9	B9	B9	B9	B10	B10	B10
H	B9	B9	B9	B9	B9	B10	B10	B10
R	4	C	5					

7				B	8						B	9				B	10	
3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8	9
B7	B7	B7	B7	B8	B8	B8	B8	B8		A	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		B	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		C	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		D	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		E	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		F	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		G	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		H	B9	B9	B9	B9	B9	B10	B10	B10
C	4						P	68		R	5	C	5					

7				B	8						B	9				B	10	
3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8	9
B7	B7	B7	B7	B8	B8	B8	B8	B8		A	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		B	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		C	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		D	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		E	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		F	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		G	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		H	B9	B9	B9	B9	B9	B10	B10	B10
C	4						P	84		R	6	C	5					

7				B	8						B	9				B	10	
3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8	9
B7	B7	B7	B7	B8	B8	B8	B8	B8		A	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		B	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		C	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		D	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		E	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		F	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		G	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		H	B9	B9	B9	B9	B9	B10	B10	B10
C	4						P	100		R	7	C	5					

7				B	8						B	9				B	10	
3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8	9
B7	B7	B7	B7	B8	B8	B8	B8	B8		A	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		B	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		C	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		D	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		E	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		F	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		G	B9	B9	B9	B9	B9	B10	B10	B10
B7	B7	B7	B7	B8	B8	B8	B8	B8		H	B9	B9	B9	B9	B9	B10	B10	B10
C	4						P	116		R	8	C	5					

				B	11				B	12						B	13	
10	11			2	3	4	5	6	7	8	9	10	11			2	3	4
B10	B10		A	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		A	B13	B13	B13
B10	B10		B	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		B	B13	B13	B13
B10	B10		C	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		C	B13	B13	B13
B10	B10		D	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		D	B13	B13	B13
B10	B10		E	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		E	B13	B13	B13
B10	B10		F	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		F	B13	B13	B13
B10	B10		G	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		G	B13	B13	B13
B10	B10		H	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		H	B13	B13	B13
P	5		R	1	C	6						P	6		R	1	C	7

				B	11				B	12						B	13	
10	11			2	3	4	5	6	7	8	9	10	11			2	3	4
B10	B10		A	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		A	B13	B13	B13
B10	B10		B	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		B	B13	B13	B13
B10	B10		C	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		C	B13	B13	B13
B10	B10		D	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		D	B13	B13	B13
B10	B10		E	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		E	B13	B13	B13
B10	B10		F	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		F	B13	B13	B13
B10	B10		G	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		G	B13	B13	B13
B10	B10		H	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		H	B13	B13	B13
P	21		R	2	C	6						P	22		R	2	C	7

				B	11				B	12						B	13	
10	11			2	3	4	5	6	7	8	9	10	11			2	3	4
B10	B10		A	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		A	B13	B13	B13
B10	B10		B	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		B	B13	B13	B13
B10	B10		C	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		C	B13	B13	B13
B10	B10		D	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		D	B13	B13	B13
B10	B10		E	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		E	B13	B13	B13
B10	B10		F	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		F	B13	B13	B13
B10	B10		G	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		G	B13	B13	B13
B10	B10		H	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		H	B13	B13	B13
P	37		R	3	C	6						P	38		R	3	C	7

				B	11				B	12						B	13	
10	11			2	3	4	5	6	7	8	9	10	11			2	3	4
B10	B10		A	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		A	B13	B13	B13
B10	B10		B	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		B	B13	B13	B13
B10	B10		C	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		C	B13	B13	B13
B10	B10		D	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		D	B13	B13	B13
B10	B10		E	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		E	B13	B13	B13
B10	B10		F	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		F	B13	B13	B13
B10	B10		G	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		G	B13	B13	B13
B10	B10		H	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12		H	B13	B13	B13
P	53		R	4	C	6						P	54		R	4	C	7

10	11
B10	B10
B10	B10
B10	B10
B10	B10
B10	B10
B10	B10
B10	B10
B10	B10
P	69

	B	11				B	12			
	2	3	4	5	6	7	8	9	10	11
A	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
B	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
C	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
D	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
E	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
F	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
G	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
H	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
R	5	C	6						P	70

	B	13	
	2	3	4
A	B13	B13	B13
B	B13	B13	B13
C	B13	B13	B13
D	B13	B13	B13
E	B13	B13	B13
F	B13	B13	B13
G	B13	B13	B13
H	B13	B13	B13
R	5	C	7

10	11
B10	B10
B10	B10
B10	B10
B10	B10
B10	B10
B10	B10
B10	B10
B10	B10
P	85

	B	11				B	12			
	2	3	4	5	6	7	8	9	10	11
A	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
B	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
C	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
D	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
E	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
F	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
G	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
H	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
R	6	C	6						P	86

	B	13	
	2	3	4
A	B13	B13	B13
B	B13	B13	B13
C	B13	B13	B13
D	B13	B13	B13
E	B13	B13	B13
F	B13	B13	B13
G	B13	B13	B13
H	B13	B13	B13
R	6	C	7

10	11
B10	B10
B10	B10
B10	B10
B10	B10
B10	B10
B10	B10
B10	B10
B10	B10
P	101

	B	11				B	12			
	2	3	4	5	6	7	8	9	10	11
A	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
B	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
C	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
D	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
E	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
F	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
G	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
H	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
R	7	C	6						P	102

	B	13	
	2	3	4
A	B13	B13	B13
B	B13	B13	B13
C	B13	B13	B13
D	B13	B13	B13
E	B13	B13	B13
F	B13	B13	B13
G	B13	B13	B13
H	B13	B13	B13
R	7	C	7

10	11
B10	B10
B10	B10
B10	B10
B10	B10
B10	B10
B10	B10
B10	B10
B10	B10
P	117

	B	11				B	12			
	2	3	4	5	6	7	8	9	10	11
A	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
B	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
C	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
D	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
E	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
F	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
G	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
H	B11	B11	B11	B11	B11	B12	B12	B12	B12	B12
R	8	C	6						P	118

	B	13	
	2	3	4
A	B13	B13	B13
B	B13	B13	B13
C	B13	B13	B13
D	B13	B13	B13
E	B13	B13	B13
F	B13	B13	B13
G	B13	B13	B13
H	B13	B13	B13
R	8	C	7

BB2

		B	14						B	15				B	16			
5	6	7	8	9	10	11			2	3	4	5	6	7	8	9	10	11
B13	B13	B14	B14	B14	B14	B14		A	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		B	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		C	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		D	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		E	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		F	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		G	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		H	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
					P	7		R	1	C	8						P	8

		B	14						B	15				B	16			
5	6	7	8	9	10	11			2	3	4	5	6	7	8	9	10	11
B13	B13	B14	B14	B14	B14	B14		A	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		B	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		C	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		D	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		E	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		F	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		G	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		H	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
					P	23		R	2	C	8						P	24

		B	14						B	15				B	16			
5	6	7	8	9	10	11			2	3	4	5	6	7	8	9	10	11
B13	B13	B14	B14	B14	B14	B14		A	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
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B13	B13	B14	B14	B14	B14	B14		C	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		D	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		E	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		F	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		G	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		H	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
					P	39		R	3	C	8						P	40

		B	14						B	15				B	16			
5	6	7	8	9	10	11			2	3	4	5	6	7	8	9	10	11
B13	B13	B14	B14	B14	B14	B14		A	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		B	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		C	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		D	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		E	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		F	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		G	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B13	B13	B14	B14	B14	B14	B14		H	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
					P	55		R	4	C	8						P	56

		B	14			
5	6	7	8	9	10	11
B13	B13	B14	B14	B14	B14	B14
B13	B13	B14	B14	B14	B14	B14
B13	B13	B14	B14	B14	B14	B14
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B13	B13	B14	B14	B14	B14	B14
B13	B13	B14	B14	B14	B14	B14
					P	71

	B	15				B	16			
	2	3	4	5	6	7	8	9	10	11
A	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
C	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
D	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
E	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
F	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
G	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
H	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
R	5	C	8						P	72

		B	14			
5	6	7	8	9	10	11
B13	B13	B14	B14	B14	B14	B14
B13	B13	B14	B14	B14	B14	B14
B13	B13	B14	B14	B14	B14	B14
B13	B13	B14	B14	B14	B14	B14
B13	B13	B14	B14	B14	B14	B14
B13	B13	B14	B14	B14	B14	B14
B13	B13	B14	B14	B14	B14	B14
					P	87

	B	15				B	16			
	2	3	4	5	6	7	8	9	10	11
A	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
C	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
D	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
E	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
F	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
G	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
H	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
R	6	C	8						P	88

		B	14			
5	6	7	8	9	10	11
B13	B13	B14	B14	B14	B14	B14
B13	B13	B14	B14	B14	B14	B14
B13	B13	B14	B14	B14	B14	B14
B13	B13	B14	B14	B14	B14	B14
B13	B13	B14	B14	B14	B14	B14
B13	B13	B14	B14	B14	B14	B14
B13	B13	B14	B14	B14	B14	B14
					P	103

	B	15				B	16			
	2	3	4	5	6	7	8	9	10	11
A	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
C	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
D	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
E	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
F	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
G	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
H	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
R	7	C	8						P	104

		B	14			
5	6	7	8	9	10	11
B13	B13	B14	B14	B14	B14	B14
B13	B13	B14	B14	B14	B14	B14
B13	B13	B14	B14	B14	B14	B14
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B13	B13	B14	B14	B14	B14	B14
B13	B13	B14	B14	B14	B14	B14
					P	119

	B	15				B	16			
	2	3	4	5	6	7	8	9	10	11
A	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
B	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
C	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
D	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
E	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
F	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
G	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
H	B15	B15	B15	B15	B15	B16	B16	B16	B16	B16
R	8	C	8						P	120

BB2

	B	17				B	18			
	2	3	4	5	6	7	8	9	10	11
A	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
B	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
C	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
D	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
E	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
F	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
G	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
H	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
R	1	C	9						P	9

	B	19			
	2	3	4	5	6
A	B19	B19	B19	B19	B19
B	B19	B19	B19	B19	B19
C	B19	B19	B19	B19	B19
D	B19	B19	B19	B19	B19
E	B19	B19	B19	B19	B19
F	B19	B19	B19	B19	B19
G	B19	B19	B19	B19	B19
H	B19	B19	B19	B19	B19
R	1	C	10		

	B	17				B	18			
	2	3	4	5	6	7	8	9	10	11
A	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
B	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
C	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
D	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
E	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
F	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
G	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
H	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
R	2	C	9						P	25

	B	19			
	2	3	4	5	6
A	B19	B19	B19	B19	B19
B	B19	B19	B19	B19	B19
C	B19	B19	B19	B19	B19
D	B19	B19	B19	B19	B19
E	B19	B19	B19	B19	B19
F	B19	B19	B19	B19	B19
G	B19	B19	B19	B19	B19
H	B19	B19	B19	B19	B19
R	2	C	10		

	B	17				B	18			
	2	3	4	5	6	7	8	9	10	11
A	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
B	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
C	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
D	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
E	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
F	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
G	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
H	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
R	3	C	9						P	41

	B	19			
	2	3	4	5	6
A	B19	B19	B19	B19	B19
B	B19	B19	B19	B19	B19
C	B19	B19	B19	B19	B19
D	B19	B19	B19	B19	B19
E	B19	B19	B19	B19	B19
F	B19	B19	B19	B19	B19
G	B19	B19	B19	B19	B19
H	B19	B19	B19	B19	B19
R	3	C	10		

	B	17				B	18			
	2	3	4	5	6	7	8	9	10	11
A	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
B	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
C	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
D	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
E	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
F	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
G	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
H	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
R	4	C	9						P	57

	B	19			
	2	3	4	5	6
A	B19	B19	B19	B19	B19
B	B19	B19	B19	B19	B19
C	B19	B19	B19	B19	B19
D	B19	B19	B19	B19	B19
E	B19	B19	B19	B19	B19
F	B19	B19	B19	B19	B19
G	B19	B19	B19	B19	B19
H	B19	B19	B19	B19	B19
R	4	C	10		

	B	17				B	18			
	2	3	4	5	6	7	8	9	10	11
A	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
B	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
C	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
D	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
E	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
F	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
G	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
H	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
R	5	C	9						P	73

	B	19			
	2	3	4	5	6
A	B19	B19	B19	B19	B19
B	B19	B19	B19	B19	B19
C	B19	B19	B19	B19	B19
D	B19	B19	B19	B19	B19
E	B19	B19	B19	B19	B19
F	B19	B19	B19	B19	B19
G	B19	B19	B19	B19	B19
H	B19	B19	B19	B19	B19
R	5	C	10		

	B	17				B	18			
	2	3	4	5	6	7	8	9	10	11
A	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
B	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
C	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
D	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
E	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
F	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
G	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
H	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
R	6	C	9						P	89

	B	19			
	2	3	4	5	6
A	B19	B19	B19	B19	B19
B	B19	B19	B19	B19	B19
C	B19	B19	B19	B19	B19
D	B19	B19	B19	B19	B19
E	B19	B19	B19	B19	B19
F	B19	B19	B19	B19	B19
G	B19	B19	B19	B19	B19
H	B19	B19	B19	B19	B19
R	6	C	10		

	B	17				B	18			
	2	3	4	5	6	7	8	9	10	11
A	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
B	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
C	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
D	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
E	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
F	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
G	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
H	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
R	7	C	9						P	105

	B	19			
	2	3	4	5	6
A	B19	B19	B19	B19	B19
B	B19	B19	B19	B19	B19
C	B19	B19	B19	B19	B19
D	B19	B19	B19	B19	B19
E	B19	B19	B19	B19	B19
F	B19	B19	B19	B19	B19
G	B19	B19	B19	B19	B19
H	B19	B19	B19	B19	B19
R	7	C	10		

	B	17				B	18			
	2	3	4	5	6	7	8	9	10	11
A	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
B	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
C	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
D	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
E	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
F	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
G	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
H	B17	B17	B17	B17	B17	B18	B18	B18	B18	B18
R	8	C	9						P	121

	B	19			
	2	3	4	5	6
A	B19	B19	B19	B19	B19
B	B19	B19	B19	B19	B19
C	B19	B19	B19	B19	B19
D	B19	B19	B19	B19	B19
E	B19	B19	B19	B19	B19
F	B19	B19	B19	B19	B19
G	B19	B19	B19	B19	B19
H	B19	B19	B19	B19	B19
R	8	C	10		

B	20						B	21					B	22				
7	8	9	10	11			2	3	4	5	6	7	8	9	10	11		
B20	B20	B20	B20	B20		A	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		A
B20	B20	B20	B20	B20		B	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		B
B20	B20	B20	B20	B20		C	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		C
B20	B20	B20	B20	B20		D	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		D
B20	B20	B20	B20	B20		E	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		E
B20	B20	B20	B20	B20		F	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		F
B20	B20	B20	B20	B20		G	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		G
B20	B20	B20	B20	B20		H	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		H
			P	10		R	1	C	11						P	11		R

B	20						B	21					B	22				
7	8	9	10	11			2	3	4	5	6	7	8	9	10	11		
B20	B20	B20	B20	B20		A	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		A
B20	B20	B20	B20	B20		B	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		B
B20	B20	B20	B20	B20		C	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		C
B20	B20	B20	B20	B20		D	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		D
B20	B20	B20	B20	B20		E	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		E
B20	B20	B20	B20	B20		F	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		F
B20	B20	B20	B20	B20		G	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		G
B20	B20	B20	B20	B20		H	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		H
			P	26		R	2	C	11						P	27		R

B	20						B	21					B	22				
7	8	9	10	11			2	3	4	5	6	7	8	9	10	11		
B20	B20	B20	B20	B20		A	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		A
B20	B20	B20	B20	B20		B	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		B
B20	B20	B20	B20	B20		C	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		C
B20	B20	B20	B20	B20		D	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		D
B20	B20	B20	B20	B20		E	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		E
B20	B20	B20	B20	B20		F	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		F
B20	B20	B20	B20	B20		G	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		G
B20	B20	B20	B20	B20		H	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		H
			P	42		R	3	C	11						P	43		R

B	20						B	21					B	22				
7	8	9	10	11			2	3	4	5	6	7	8	9	10	11		
B20	B20	B20	B20	B20		A	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		A
B20	B20	B20	B20	B20		B	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		B
B20	B20	B20	B20	B20		C	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		C
B20	B20	B20	B20	B20		D	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		D
B20	B20	B20	B20	B20		E	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		E
B20	B20	B20	B20	B20		F	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		F
B20	B20	B20	B20	B20		G	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		G
B20	B20	B20	B20	B20		H	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22		H
			P	58		R	4	C	11						P	59		R

B	20			
7	8	9	10	11
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
			P	74

	B	21				B	22			
	2	3	4	5	6	7	8	9	10	11
A	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
B	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
C	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
D	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
E	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
F	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
G	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
H	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
R	5	C	11						P	75

B	20			
7	8	9	10	11
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
			P	90

	B	21				B	22			
	2	3	4	5	6	7	8	9	10	11
A	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
B	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
C	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
D	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
E	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
F	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
G	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
H	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
R	.6	C	11						P	91

B	20			
7	8	9	10	11
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
			P	106

	B	21				B	22			
	2	3	4	5	6	7	8	9	10	11
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B	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
C	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
D	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
E	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
F	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
G	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
H	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
R	7	C	11						P	107

B	20			
7	8	9	10	11
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B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
B20	B20	B20	B20	B20
			P	122

	B	21				B	22			
	2	3	4	5	6	7	8	9	10	11
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B	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
C	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
D	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
E	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
F	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
G	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
H	B21	B21	B21	B21	B21	B22	B22	B22	B22	B22
R	8	C	11						P	123

BB2

B	23				B	24			
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1	C	12						P	12

	B	25				B	26
	2	3	4	5	6	7	8
A	B25	B25	B25	B25	B25	B26	B26
B	B25	B25	B25	B25	B25	B26	B26
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D	B25	B25	B25	B25	B25	B26	B26
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F	B25	B25	B25	B25	B25	B26	B26
G	B25	B25	B25	B25	B25	B26	B26
H	B25	B25	B25	B25	B25	B26	B26
R	1	C	13				

B	23				B	24			
2	3	4	5	6	7	8	9	10	11
B23	B23	B23	B23	B23	B24	B24	B24	B24	B24
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2	C	12						P	28

	B	25				B	26
	2	3	4	5	6	7	8
A	B25	B25	B25	B25	B25	B26	B26
B	B25	B25	B25	B25	B25	B26	B26
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H	B25	B25	B25	B25	B25	B26	B26
R	2	C	13				

B	23				B	24			
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3	C	12						P	44

	B	25				B	26
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H	B25	B25	B25	B25	B25	B26	B26
R	3	C	13				

B	23				B	24			
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4	C	12						P	60

	B	25				B	26
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F	B25	B25	B25	B25	B25	B26	B26
G	B25	B25	B25	B25	B25	B26	B26
H	B25	B25	B25	B25	B25	B26	B26
R	4	C	13				

BB2

B	23				B	24						B	25				B	26
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5	C	12						P	76		R	5	C	13				
B	23				B	24						B	25				B	26
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6	C	12						P	92		R	6	C	13				
B	23				B	24						B	25				B	26
2	3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8
B23	B23	B23	B23	B23	B24	B24	B24	B24	B24		A	B25	B25	B25	B25	B25	B26	B26
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7	C	12						P	108		R	7	C	13				
B	23				B	24						B	25				B	26
2	3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8
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8	C	12						P	124		R	8	C	13				

					B	27				B	28						B	29	
9	10	11			2	3	4	5	6	7	8	9	10	11			2	3	
B26	B26	B26		A	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		A	B29	B29	
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	P	13		R	1	C	14						P	14		R	1	C	
					B	27				B	28						B	29	
9	10	11			2	3	4	5	6	7	8	9	10	11			2	3	
B26	B26	B26		A	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		A	B29	B29	
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	P	29		R	2	C	14						P	30		R	2	C	
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9	10	11			2	3	4	5	6	7	8	9	10	11			2	3	
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	P	45		R	3	C	14						P	46		R	3	C	
					B	27				B	28						B	29	
9	10	11			2	3	4	5	6	7	8	9	10	11			2	3	
B26	B26	B26		A	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		A	B29	B29	
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B26	B26	B26		H	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		H	B29	B29	
	P	61		R	4	C	14						P	62		R	4	C	

BB2

					B	27				B	28						B	29		
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B26	B26	B26		A	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		A	B29	B29		
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	P	77		R	5	C	14						P	78		R	5	C		
					B	27				B	28						B	29		
9	10	11			2	3	4	5	6	7	8	9	10	11			2	3		
B26	B26	B26		A	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		A	B29	B29		
B26	B26	B26		B	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		B	B29	B29		
B26	B26	B26		C	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		C	B29	B29		
B26	B26	B26		D	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		D	B29	B29		
B26	B26	B26		E	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		E	B29	B29		
B26	B26	B26		F	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		F	B29	B29		
B26	B26	B26		G	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		G	B29	B29		
B26	B26	B26		H	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		H	B29	B29		
	P	93		R	6	C	14						P	94		R	6	C		
					B	27				B	28						B	29		
9	10	11			2	3	4	5	6	7	8	9	10	11			2	3		
B26	B26	B26		A	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		A	B29	B29		
B26	B26	B26		B	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		B	B29	B29		
B26	B26	B26		C	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		C	B29	B29		
B26	B26	B26		D	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		D	B29	B29		
B26	B26	B26		E	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		E	B29	B29		
B26	B26	B26		F	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		F	B29	B29		
B26	B26	B26		G	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		G	B29	B29		
B26	B26	B26		H	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		H	B29	B29		
	P	109		R	7	C	14						P	110		R	7	C		
					B	27				B	28						B	29		
9	10	11			2	3	4	5	6	7	8	9	10	11			2	3		
B26	B26	B26		A	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		A	B29	B29		
B26	B26	B26		B	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		B	B29	B29		
B26	B26	B26		C	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		C	B29	B29		
B26	B26	B26		D	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		D	B29	B29		
B26	B26	B26		E	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		E	B29	B29		
B26	B26	B26		F	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		F	B29	B29		
B26	B26	B26		G	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		G	B29	B29		
B26	B26	B26		H	B27	B27	B27	B27	B27	B28	B28	B28	B28	B28		H	B29	B29		
	P	125		R	8	C	14						P	126		R	8	C		

BB2

			B	30					B	31				B	32		
4	5	6	7	8	9	10	11		2	3	4	5	6	7	8	9	10
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B29	B29	B29	B30	B30	B30	B30	B30	B	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30	C	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30	D	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30	E	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30	F	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30	G	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30	H	B31	B31	B31	B31	B31	B32	B32	B32	B32
15						P	15	R	1	C	16					- -	P

			B	30					B	31				B	32		
4	5	6	7	8	9	10	11		2	3	4	5	6	7	8	9	10
B29	B29	B29	B30	B30	B30	B30	B30	A	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30	B	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30	C	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30	D	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30	E	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30	F	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30	G	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30	H	B31	B31	B31	B31	B31	B32	B32	B32	B32
15						P	31	R	2	C	16						P

			B	30					B	31				B	32		
4	5	6	7	8	9	10	11		2	3	4	5	6	7	8	9	10
B29	B29	B29	B30	B30	B30	B30	B30	A	B31	B31	B31	B31	B31	B32	B32	B32	B32
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B29	B29	B29	B30	B30	B30	B30	B30	H	B31	B31	B31	B31	B31	B32	B32	B32	B32
15						P	47	R	3	C	16						P

			B	30					B	31				B	32		
4	5	6	7	8	9	10	11		2	3	4	5	6	7	8	9	10
B29	B29	B29	B30	B30	B30	B30	B30	A	B31	B31	B31	B31	B31	B32	B32	B32	B32
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B29	B29	B29	B30	B30	B30	B30	B30	F	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30	G	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30	H	B31	B31	B31	B31	B31	B32	B32	B32	B32
15						P	63	R	4	C	16						P

BB2

			B	30						B	31				B	32		
4	5	6	7	8	9	10	11			2	3	4	5	6	7	8	9	10
B29	B29	B29	B30	B30	B30	B30	B30		A	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		B	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		C	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		D	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		E	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		F	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		G	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		H	B31	B31	B31	B31	B31	B32	B32	B32	B32
15						P	79		R	5	C	16						P

			B	30						B	31				B	32		
4	5	6	7	8	9	10	11			2	3	4	5	6	7	8	9	10
B29	B29	B29	B30	B30	B30	B30	B30		A	B31	B31	B31	B31	B31	B32	B32	B32	B32
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B29	B29	B29	B30	B30	B30	B30	B30		C	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		D	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		E	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		F	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		G	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		H	B31	B31	B31	B31	B31	B32	B32	B32	B32
15						P	95		R	6	C	16						P

			B	30						B	31				B	32		
4	5	6	7	8	9	10	11			2	3	4	5	6	7	8	9	10
B29	B29	B29	B30	B30	B30	B30	B30		A	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		B	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		C	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		D	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		E	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		F	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		G	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		H	B31	B31	B31	B31	B31	B32	B32	B32	B32
15						P	111		R	7	C	16						P

			B	30						B	31				B	32		
4	5	6	7	8	9	10	11			2	3	4	5	6	7	8	9	10
B29	B29	B29	B30	B30	B30	B30	B30		A	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		B	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		C	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		D	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		E	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		F	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		G	B31	B31	B31	B31	B31	B32	B32	B32	B32
B29	B29	B29	B30	B30	B30	B30	B30		H	B31	B31	B31	B31	B31	B32	B32	B32	B32
15						P	127		R	8	C	16						P

BB2

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BB3

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	1	C	1						P	1

	C1-40					C1-4
	2	3	4	5	6	7
A	C1	C9	C17	C25	C33	C1
B	C2	C10	C18	C26	C34	C2
C	C3	C11	C19	C27	C35	C3
D	C4	C12	C20	C28	C36	C4
E	C5	C13	C21	C29	C37	C5
F	C6	C14	C22	C30	C38	C6
G	C7	C15	C23	C31	C39	C7
H	C8	C16	C24	C32	C40	C8
R	1	C	2			

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	2	C	1						P	17

	C1-40					C1-4
	2	3	4	5	6	7
A	C1	C9	C17	C25	C33	C1
B	C2	C10	C18	C26	C34	C2
C	C3	C11	C19	C27	C35	C3
D	C4	C12	C20	C28	C36	C4
E	C5	C13	C21	C29	C37	C5
F	C6	C14	C22	C30	C38	C6
G	C7	C15	C23	C31	C39	C7
H	C8	C16	C24	C32	C40	C8
R	2	C	2			

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	3	C	1						P	33

	C1-40					C1-4
	2	3	4	5	6	7
A	C1	C9	C17	C25	C33	C1
B	C2	C10	C18	C26	C34	C2
C	C3	C11	C19	C27	C35	C3
D	C4	C12	C20	C28	C36	C4
E	C5	C13	C21	C29	C37	C5
F	C6	C14	C22	C30	C38	C6
G	C7	C15	C23	C31	C39	C7
H	C8	C16	C24	C32	C40	C8
R	3	C	2			

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	4	C	1						P	49

	C1-40					C1-4
	2	3	4	5	6	7
A	C1	C9	C17	C25	C33	C1
B	C2	C10	C18	C26	C34	C2
C	C3	C11	C19	C27	C35	C3
D	C4	C12	C20	C28	C36	C4
E	C5	C13	C21	C29	C37	C5
F	C6	C14	C22	C30	C38	C6
G	C7	C15	C23	C31	C39	C7
H	C8	C16	C24	C32	C40	C8
R	4	C	2			

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	5	C	1						P	65

	C1-40					C1-4
	2	3	4	5	6	7
A	C1	C9	C17	C25	C33	C1
B	C2	C10	C18	C26	C34	C2
C	C3	C11	C19	C27	C35	C3
D	C4	C12	C20	C28	C36	C4
E	C5	C13	C21	C29	C37	C5
F	C6	C14	C22	C30	C38	C6
G	C7	C15	C23	C31	C39	C7
H	C8	C16	C24	C32	C40	C8
R	5	C	2			

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	6	C	1						P	81

	C1-40					C1-4
	2	3	4	5	6	7
A	C1	C9	C17	C25	C33	C1
B	C2	C10	C18	C26	C34	C2
C	C3	C11	C19	C27	C35	C3
D	C4	C12	C20	C28	C36	C4
E	C5	C13	C21	C29	C37	C5
F	C6	C14	C22	C30	C38	C6
G	C7	C15	C23	C31	C39	C7
H	C8	C16	C24	C32	C40	C8
R	6	C	2			

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	7	C	1						P	97

	C1-40					C1-4
	2	3	4	5	6	7
A	C1	C9	C17	C25	C33	C1
B	C2	C10	C18	C26	C34	C2
C	C3	C11	C19	C27	C35	C3
D	C4	C12	C20	C28	C36	C4
E	C5	C13	C21	C29	C37	C5
F	C6	C14	C22	C30	C38	C6
G	C7	C15	C23	C31	C39	C7
H	C8	C16	C24	C32	C40	C8
R	7	C	2			

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	8	C	1						P	113

	C1-40					C1-4
	2	3	4	5	6	7
A	C1	C9	C17	C25	C33	C1
B	C2	C10	C18	C26	C34	C2
C	C3	C11	C19	C27	C35	C3
D	C4	C12	C20	C28	C36	C4
E	C5	C13	C21	C29	C37	C5
F	C6	C14	C22	C30	C38	C6
G	C7	C15	C23	C31	C39	C7
H	C8	C16	C24	C32	C40	C8
R	8	C	2			

						C1-40					C1-40						C1-4
8	9	10	11			2	3	4	5	6	7	8	9	10	11		2
C9	C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1
C10	C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2
C11	C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3
C12	C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4
C13	C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5
C14	C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6
C15	C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7
C16	C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8
		P	2		R	1	C	3						P	3	R	1

						C1-40					C1-40						C1-4
8	9	10	11			2	3	4	5	6	7	8	9	10	11		2
C9	C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1
C10	C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2
C11	C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3
C12	C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4
C13	C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5
C14	C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6
C15	C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7
C16	C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8
		P	18		R	2	C	3						P	19	R	2

						C1-40					C1-40						C1-4
8	9	10	11			2	3	4	5	6	7	8	9	10	11		2
C9	C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1
C10	C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2
C11	C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3
C12	C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4
C13	C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5
C14	C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6
C15	C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7
C16	C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8
		P	34		R	3	C	3						P	35	R	3

						C1-40					C1-40						C1-4
8	9	10	11			2	3	4	5	6	7	8	9	10	11		2
C9	C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1
C10	C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2
C11	C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3
C12	C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4
C13	C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5
C14	C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6
C15	C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7
C16	C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8
		P	50		R	4	C	3						P	51	R	4

8	9	10	11
C9	C17	C25	C33
C10	C18	C26	C34
C11	C19	C27	C35
C12	C20	C28	C36
C13	C21	C29	C37
C14	C22	C30	C38
C15	C23	C31	C39
C16	C24	C32	C40
		P	66

	C1-40				
	2	3	4	5	6
A	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40
R	5	C	3		

C1-40					
7	8	9	10	11	
C1	C9	C17	C25	C33	A
C2	C10	C18	C26	C34	B
C3	C11	C19	C27	C35	C
C4	C12	C20	C28	C36	D
C5	C13	C21	C29	C37	E
C6	C14	C22	C30	C38	F
C7	C15	C23	C31	C39	G
C8	C16	C24	C32	C40	H
			P	67	R

C1-4	
2	
C1	A
C2	B
C3	C
C4	D
C5	E
C6	F
C7	G
C8	H
5	R

8	9	10	11
C9	C17	C25	C33
C10	C18	C26	C34
C11	C19	C27	C35
C12	C20	C28	C36
C13	C21	C29	C37
C14	C22	C30	C38
C15	C23	C31	C39
C16	C24	C32	C40
		P	82

	C1-40				
	2	3	4	5	6
A	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40
R	6	C	3		

C1-40					
7	8	9	10	11	
C1	C9	C17	C25	C33	A
C2	C10	C18	C26	C34	B
C3	C11	C19	C27	C35	C
C4	C12	C20	C28	C36	D
C5	C13	C21	C29	C37	E
C6	C14	C22	C30	C38	F
C7	C15	C23	C31	C39	G
C8	C16	C24	C32	C40	H
			P	83	R

C1-4	
2	
C1	A
C2	B
C3	C
C4	D
C5	E
C6	F
C7	G
C8	H
6	R

8	9	10	11
C9	C17	C25	C33
C10	C18	C26	C34
C11	C19	C27	C35
C12	C20	C28	C36
C13	C21	C29	C37
C14	C22	C30	C38
C15	C23	C31	C39
C16	C24	C32	C40
		P	98

	C1-40				
	2	3	4	5	6
A	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40
R	7	C	3		

C1-40					
7	8	9	10	11	
C1	C9	C17	C25	C33	A
C2	C10	C18	C26	C34	B
C3	C11	C19	C27	C35	C
C4	C12	C20	C28	C36	D
C5	C13	C21	C29	C37	E
C6	C14	C22	C30	C38	F
C7	C15	C23	C31	C39	G
C8	C16	C24	C32	C40	H
			P	99	R

C1-4	
2	
C1	A
C2	B
C3	C
C4	D
C5	E
C6	F
C7	G
C8	H
7	R

8	9	10	11
C9	C17	C25	C33
C10	C18	C26	C34
C11	C19	C27	C35
C12	C20	C28	C36
C13	C21	C29	C37
C14	C22	C30	C38
C15	C23	C31	C39
C16	C24	C32	C40
		P	114

	C1-40				
	2	3	4	5	6
A	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40
R	8	C	3		

C1-40					
7	8	9	10	11	
C1	C9	C17	C25	C33	A
C2	C10	C18	C26	C34	B
C3	C11	C19	C27	C35	C
C4	C12	C20	C28	C36	D
C5	C13	C21	C29	C37	E
C6	C14	C22	C30	C38	F
C7	C15	C23	C31	C39	G
C8	C16	C24	C32	C40	H
			P	115	R

C1-4	
2	
C1	A
C2	B
C3	C
C4	D
C5	E
C6	F
C7	G
C8	H
8	R

				C1-40				
3	4	5	6	7	8	9	10	11
C9	C17	C25	C33	C1	C9	C17	C25	C33
C10	C18	C26	C34	C2	C10	C18	C26	C34
C11	C19	C27	C35	C3	C11	C19	C27	C35
C12	C20	C28	C36	C4	C12	C20	C28	C36
C13	C21	C29	C37	C5	C13	C21	C29	C37
C14	C22	C30	C38	C6	C14	C22	C30	C38
C15	C23	C31	C39	C7	C15	C23	C31	C39
C16	C24	C32	C40	C8	C16	C24	C32	C40
C	4						P	4

	C1-40					C1-40		
	2	3	4	5	6	7	8	9
A	C1	C9	C17	C25	C33	C1	C9	C17
B	C2	C10	C18	C26	C34	C2	C10	C18
C	C3	C11	C19	C27	C35	C3	C11	C19
D	C4	C12	C20	C28	C36	C4	C12	C20
E	C5	C13	C21	C29	C37	C5	C13	C21
F	C6	C14	C22	C30	C38	C6	C14	C22
G	C7	C15	C23	C31	C39	C7	C15	C23
H	C8	C16	C24	C32	C40	C8	C16	C24
R	1	C	5					

				C1-40				
3	4	5	6	7	8	9	10	11
C9	C17	C25	C33	C1	C9	C17	C25	C33
C10	C18	C26	C34	C2	C10	C18	C26	C34
C11	C19	C27	C35	C3	C11	C19	C27	C35
C12	C20	C28	C36	C4	C12	C20	C28	C36
C13	C21	C29	C37	C5	C13	C21	C29	C37
C14	C22	C30	C38	C6	C14	C22	C30	C38
C15	C23	C31	C39	C7	C15	C23	C31	C39
C16	C24	C32	C40	C8	C16	C24	C32	C40
C	4						P	20

	C1-40					C1-40		
	2	3	4	5	6	7	8	9
A	C1	C9	C17	C25	C33	C1	C9	C17
B	C2	C10	C18	C26	C34	C2	C10	C18
C	C3	C11	C19	C27	C35	C3	C11	C19
D	C4	C12	C20	C28	C36	C4	C12	C20
E	C5	C13	C21	C29	C37	C5	C13	C21
F	C6	C14	C22	C30	C38	C6	C14	C22
G	C7	C15	C23	C31	C39	C7	C15	C23
H	C8	C16	C24	C32	C40	C8	C16	C24
R	2	C	5					

				C1-40				
3	4	5	6	7	8	9	10	11
C9	C17	C25	C33	C1	C9	C17	C25	C33
C10	C18	C26	C34	C2	C10	C18	C26	C34
C11	C19	C27	C35	C3	C11	C19	C27	C35
C12	C20	C28	C36	C4	C12	C20	C28	C36
C13	C21	C29	C37	C5	C13	C21	C29	C37
C14	C22	C30	C38	C6	C14	C22	C30	C38
C15	C23	C31	C39	C7	C15	C23	C31	C39
C16	C24	C32	C40	C8	C16	C24	C32	C40
C	4						P	36

	C1-40					C1-40		
	2	3	4	5	6	7	8	9
A	C1	C9	C17	C25	C33	C1	C9	C17
B	C2	C10	C18	C26	C34	C2	C10	C18
C	C3	C11	C19	C27	C35	C3	C11	C19
D	C4	C12	C20	C28	C36	C4	C12	C20
E	C5	C13	C21	C29	C37	C5	C13	C21
F	C6	C14	C22	C30	C38	C6	C14	C22
G	C7	C15	C23	C31	C39	C7	C15	C23
H	C8	C16	C24	C32	C40	C8	C16	C24
R	3	C	5					

				C1-40				
3	4	5	6	7	8	9	10	11
C9	C17	C25	C33	C1	C9	C17	C25	C33
C10	C18	C26	C34	C2	C10	C18	C26	C34
C11	C19	C27	C35	C3	C11	C19	C27	C35
C12	C20	C28	C36	C4	C12	C20	C28	C36
C13	C21	C29	C37	C5	C13	C21	C29	C37
C14	C22	C30	C38	C6	C14	C22	C30	C38
C15	C23	C31	C39	C7	C15	C23	C31	C39
C16	C24	C32	C40	C8	C16	C24	C32	C40
C	4						P	52

	C1-40					C1-40		
	2	3	4	5	6	7	8	9
A	C1	C9	C17	C25	C33	C1	C9	C17
B	C2	C10	C18	C26	C34	C2	C10	C18
C	C3	C11	C19	C27	C35	C3	C11	C19
D	C4	C12	C20	C28	C36	C4	C12	C20
E	C5	C13	C21	C29	C37	C5	C13	C21
F	C6	C14	C22	C30	C38	C6	C14	C22
G	C7	C15	C23	C31	C39	C7	C15	C23
H	C8	C16	C24	C32	C40	C8	C16	C24
R	4	C	5					

BB3

				C1-40							C1-40					C1-40		
3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8	9
C9	C17	C25	C33	C1	C9	C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17
C10	C18	C26	C34	C2	C10	C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18
C11	C19	C27	C35	C3	C11	C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19
C12	C20	C28	C36	C4	C12	C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20
C13	C21	C29	C37	C5	C13	C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21
C14	C22	C30	C38	C6	C14	C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22
C15	C23	C31	C39	C7	C15	C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23
C16	C24	C32	C40	C8	C16	C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24
C	4						P	68		R	5	C	5					
				C1-40							C1-40					C1-40		
3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8	9
C9	C17	C25	C33	C1	C9	C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17
C10	C18	C26	C34	C2	C10	C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18
C11	C19	C27	C35	C3	C11	C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19
C12	C20	C28	C36	C4	C12	C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20
C13	C21	C29	C37	C5	C13	C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21
C14	C22	C30	C38	C6	C14	C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22
C15	C23	C31	C39	C7	C15	C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23
C16	C24	C32	C40	C8	C16	C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24
C	4						P	84		R	6	C	5					
				C1-40							C1-40					C1-40		
3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8	9
C9	C17	C25	C33	C1	C9	C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17
C10	C18	C26	C34	C2	C10	C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18
C11	C19	C27	C35	C3	C11	C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19
C12	C20	C28	C36	C4	C12	C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20
C13	C21	C29	C37	C5	C13	C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21
C14	C22	C30	C38	C6	C14	C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22
C15	C23	C31	C39	C7	C15	C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23
C16	C24	C32	C40	C8	C16	C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24
C	4						P	100		R	7	C	5					
				C1-40							C1-40					C1-40		
3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8	9
C9	C17	C25	C33	C1	C9	C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17
C10	C18	C26	C34	C2	C10	C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18
C11	C19	C27	C35	C3	C11	C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19
C12	C20	C28	C36	C4	C12	C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20
C13	C21	C29	C37	C5	C13	C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21
C14	C22	C30	C38	C6	C14	C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22
C15	C23	C31	C39	C7	C15	C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23
C16	C24	C32	C40	C8	C16	C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24
C	4						P	116		R	8	C	5					

BB3

				C1-40					C1-40						C1-40		
10	11			2	3	4	5	6	7	8	9	10	11		2	3	4
C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1	C9	C17
C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2	C10	C18
C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3	C11	C19
C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4	C12	C20
C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5	C13	C21
C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6	C14	C22
C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7	C15	C23
C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8	C16	C24
P	5		R	1	C	6						P	6	R	1	C	7

				C1-40					C1-40						C1-40		
10	11			2	3	4	5	6	7	8	9	10	11		2	3	4
C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1	C9	C17
C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2	C10	C18
C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3	C11	C19
C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4	C12	C20
C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5	C13	C21
C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6	C14	C22
C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7	C15	C23
C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8	C16	C24
P	21		R	2	C	6						P	22	R	2	C	7

				C1-40					C1-40						C1-40		
10	11			2	3	4	5	6	7	8	9	10	11		2	3	4
C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1	C9	C17
C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2	C10	C18
C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3	C11	C19
C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4	C12	C20
C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5	C13	C21
C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6	C14	C22
C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7	C15	C23
C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8	C16	C24
P	37		R	3	C	6						P	38	R	3	C	7

				C1-40					C1-40						C1-40		
10	11			2	3	4	5	6	7	8	9	10	11		2	3	4
C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1	C9	C17
C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2	C10	C18
C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3	C11	C19
C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4	C12	C20
C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5	C13	C21
C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6	C14	C22
C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7	C15	C23
C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8	C16	C24
P	53		R	4	C	6						P	54	R	4	C	7

				C1-40					C1-40						C1-40		
10	11			2	3	4	5	6	7	8	9	10	11		2	3	4
C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1	C9	C17
C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2	C10	C18
C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3	C11	C19
C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4	C12	C20
C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5	C13	C21
C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6	C14	C22
C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7	C15	C23
C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8	C16	C24
P	69		R	5	C	6						P	70	R	5	C	7

				C1-40					C1-40						C1-40		
10	11			2	3	4	5	6	7	8	9	10	11		2	3	4
C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1	C9	C17
C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2	C10	C18
C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3	C11	C19
C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4	C12	C20
C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5	C13	C21
C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6	C14	C22
C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7	C15	C23
C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8	C16	C24
P	85		R	6	C	6						P	86	R	6	C	7

				C1-40					C1-40						C1-40		
10	11			2	3	4	5	6	7	8	9	10	11		2	3	4
C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1	C9	C17
C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2	C10	C18
C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3	C11	C19
C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4	C12	C20
C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5	C13	C21
C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6	C14	C22
C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7	C15	C23
C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8	C16	C24
P	101		R	7	C	6						P	102	R	7	C	7

				C1-40					C1-40						C1-40		
10	11			2	3	4	5	6	7	8	9	10	11		2	3	4
C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1	C9	C17
C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2	C10	C18
C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3	C11	C19
C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4	C12	C20
C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5	C13	C21
C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6	C14	C22
C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7	C15	C23
C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8	C16	C24
P	117		R	8	C	6						P	118	R	8	C	7

		C1-40				
5	6	7	8	9	10	11
C25	C33	C1	C9	C17	C25	C33
C26	C34	C2	C10	C18	C26	C34
C27	C35	C3	C11	C19	C27	C35
C28	C36	C4	C12	C20	C28	C36
C29	C37	C5	C13	C21	C29	C37
C30	C38	C6	C14	C22	C30	C38
C31	C39	C7	C15	C23	C31	C39
C32	C40	C8	C16	C24	C32	C40
					P	7

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	1	C	8						P	8

		C1-40				
5	6	7	8	9	10	11
C25	C33	C1	C9	C17	C25	C33
C26	C34	C2	C10	C18	C26	C34
C27	C35	C3	C11	C19	C27	C35
C28	C36	C4	C12	C20	C28	C36
C29	C37	C5	C13	C21	C29	C37
C30	C38	C6	C14	C22	C30	C38
C31	C39	C7	C15	C23	C31	C39
C32	C40	C8	C16	C24	C32	C40
					P	23

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	2	C	8						P	24

		C1-40				
5	6	7	8	9	10	11
C25	C33	C1	C9	C17	C25	C33
C26	C34	C2	C10	C18	C26	C34
C27	C35	C3	C11	C19	C27	C35
C28	C36	C4	C12	C20	C28	C36
C29	C37	C5	C13	C21	C29	C37
C30	C38	C6	C14	C22	C30	C38
C31	C39	C7	C15	C23	C31	C39
C32	C40	C8	C16	C24	C32	C40
					P	39

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	3	C	8						P	40

		C1-40				
5	6	7	8	9	10	11
C25	C33	C1	C9	C17	C25	C33
C26	C34	C2	C10	C18	C26	C34
C27	C35	C3	C11	C19	C27	C35
C28	C36	C4	C12	C20	C28	C36
C29	C37	C5	C13	C21	C29	C37
C30	C38	C6	C14	C22	C30	C38
C31	C39	C7	C15	C23	C31	C39
C32	C40	C8	C16	C24	C32	C40
					P	55

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	4	C	8						P	56

		C1-40				
5	6	7	8	9	10	11
C25	C33	C1	C9	C17	C25	C33
C26	C34	C2	C10	C18	C26	C34
C27	C35	C3	C11	C19	C27	C35
C28	C36	C4	C12	C20	C28	C36
C29	C37	C5	C13	C21	C29	C37
C30	C38	C6	C14	C22	C30	C38
C31	C39	C7	C15	C23	C31	C39
C32	C40	C8	C16	C24	C32	C40
					P	71

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	5	C	8						P	72

		C1-40				
5	6	7	8	9	10	11
C25	C33	C1	C9	C17	C25	C33
C26	C34	C2	C10	C18	C26	C34
C27	C35	C3	C11	C19	C27	C35
C28	C36	C4	C12	C20	C28	C36
C29	C37	C5	C13	C21	C29	C37
C30	C38	C6	C14	C22	C30	C38
C31	C39	C7	C15	C23	C31	C39
C32	C40	C8	C16	C24	C32	C40
					P	87

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	6	C	8						P	88

		C1-40				
5	6	7	8	9	10	11
C25	C33	C1	C9	C17	C25	C33
C26	C34	C2	C10	C18	C26	C34
C27	C35	C3	C11	C19	C27	C35
C28	C36	C4	C12	C20	C28	C36
C29	C37	C5	C13	C21	C29	C37
C30	C38	C6	C14	C22	C30	C38
C31	C39	C7	C15	C23	C31	C39
C32	C40	C8	C16	C24	C32	C40
					P	103

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	7	C	8						P	104

		C1-40				
5	6	7	8	9	10	11
C25	C33	C1	C9	C17	C25	C33
C26	C34	C2	C10	C18	C26	C34
C27	C35	C3	C11	C19	C27	C35
C28	C36	C4	C12	C20	C28	C36
C29	C37	C5	C13	C21	C29	C37
C30	C38	C6	C14	C22	C30	C38
C31	C39	C7	C15	C23	C31	C39
C32	C40	C8	C16	C24	C32	C40
					P	119

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	8	C	8						P	120

BB3

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	1	C	-9						P	9

	C1-40				
	2	3	4	5	6
A	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40
R	1	C	10		

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	2	C	9						P	25

	C1-40				
	2	3	4	5	6
A	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40
R	2	C	10		

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	3	C	9						P	41

	C1-40				
	2	3	4	5	6
A	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40
R	3	C	10		

	C1-40					C1-40				
	2	3	4	5	6	7	8	9	10	11
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
R	4	C	9						P	57

	C1-40				
	2	3	4	5	6
A	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40
R	4	C	10		

BB3

	C1-40					C1-40							C1-40				
	2	3	4	5	6	7	8	9	10	11			2	3	4	5	6
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33		A	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34		B	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35		C	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36		D	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37		E	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38		F	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39		G	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40		H	C8	C16	C24	C32	C40
R	5	C	9						P	73		R	5	C	10		
	C1-40					C1-40							C1-40				
	2	3	4	5	6	7	8	9	10	11			2	3	4	5	6
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33		A	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34		B	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35		C	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36		D	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37		E	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38		F	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39		G	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40		H	C8	C16	C24	C32	C40
R	6	C	9						P	89		R	6	C	10		
	C1-40					C1-40							C1-40				
	2	3	4	5	6	7	8	9	10	11			2	3	4	5	6
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33		A	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34		B	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35		C	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36		D	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37		E	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38		F	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39		G	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40		H	C8	C16	C24	C32	C40
R	7	C	9						P	105		R	7	C	10		
	C1-40					C1-40							C1-40				
	2	3	4	5	6	7	8	9	10	11			2	3	4	5	6
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33		A	C1	C9	C17	C25	C33
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34		B	C2	C10	C18	C26	C34
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35		C	C3	C11	C19	C27	C35
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36		D	C4	C12	C20	C28	C36
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37		E	C5	C13	C21	C29	C37
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38		F	C6	C14	C22	C30	C38
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39		G	C7	C15	C23	C31	C39
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40		H	C8	C16	C24	C32	C40
R	8	C	9						P	121		R	8	C	10		

C1-40				
7	8	9	10	11
C1	C9	C17	C25	C33
C2	C10	C18	C26	C34
C3	C11	C19	C27	C35
C4	C12	C20	C28	C36
C5	C13	C21	C29	C37
C6	C14	C22	C30	C38
C7	C15	C23	C31	C39
C8	C16	C24	C32	C40
			P	10

	C1-40					C1-40					
	2	3	4	5	6	7	8	9	10	11	
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H
R	1	C	11						P	11	R

C1-40				
7	8	9	10	11
C1	C9	C17	C25	C33
C2	C10	C18	C26	C34
C3	C11	C19	C27	C35
C4	C12	C20	C28	C36
C5	C13	C21	C29	C37
C6	C14	C22	C30	C38
C7	C15	C23	C31	C39
C8	C16	C24	C32	C40
			P	26

	C1-40					C1-40					
	2	3	4	5	6	7	8	9	10	11	
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H
R	2	C	11						P	27	R

C1-40				
7	8	9	10	11
C1	C9	C17	C25	C33
C2	C10	C18	C26	C34
C3	C11	C19	C27	C35
C4	C12	C20	C28	C36
C5	C13	C21	C29	C37
C6	C14	C22	C30	C38
C7	C15	C23	C31	C39
C8	C16	C24	C32	C40
			P	42

	C1-40					C1-40					
	2	3	4	5	6	7	8	9	10	11	
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H
R	3	C	11						P	43	R

C1-40				
7	8	9	10	11
C1	C9	C17	C25	C33
C2	C10	C18	C26	C34
C3	C11	C19	C27	C35
C4	C12	C20	C28	C36
C5	C13	C21	C29	C37
C6	C14	C22	C30	C38
C7	C15	C23	C31	C39
C8	C16	C24	C32	C40
			P	58

	C1-40					C1-40					
	2	3	4	5	6	7	8	9	10	11	
A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A
B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B
C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C
D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D
E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E
F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F
G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G
H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H
R	4	C	11						P	59	R

C1-40							C1-40						C1-40					
7	8	9	10	11			2	3	4	5	6		7	8	9	10	11	
C1	C9	C17	C25	C33		A	C1	C9	C17	C25	C33		C1	C9	C17	C25	C33	A
C2	C10	C18	C26	C34		B	C2	C10	C18	C26	C34		C2	C10	C18	C26	C34	B
C3	C11	C19	C27	C35		C	C3	C11	C19	C27	C35		C3	C11	C19	C27	C35	C
C4	C12	C20	C28	C36		D	C4	C12	C20	C28	C36		C4	C12	C20	C28	C36	D
C5	C13	C21	C29	C37		E	C5	C13	C21	C29	C37		C5	C13	C21	C29	C37	E
C6	C14	C22	C30	C38		F	C6	C14	C22	C30	C38		C6	C14	C22	C30	C38	F
C7	C15	C23	C31	C39		G	C7	C15	C23	C31	C39		C7	C15	C23	C31	C39	G
C8	C16	C24	C32	C40		H	C8	C16	C24	C32	C40		C8	C16	C24	C32	C40	H
			P	74		R	5	C	11							P	75	R

C1-40							C1-40						C1-40					
7	8	9	10	11			2	3	4	5	6		7	8	9	10	11	
C1	C9	C17	C25	C33		A	C1	C9	C17	C25	C33		C1	C9	C17	C25	C33	A
C2	C10	C18	C26	C34		B	C2	C10	C18	C26	C34		C2	C10	C18	C26	C34	B
C3	C11	C19	C27	C35		C	C3	C11	C19	C27	C35		C3	C11	C19	C27	C35	C
C4	C12	C20	C28	C36		D	C4	C12	C20	C28	C36		C4	C12	C20	C28	C36	D
C5	C13	C21	C29	C37		E	C5	C13	C21	C29	C37		C5	C13	C21	C29	C37	E
C6	C14	C22	C30	C38		F	C6	C14	C22	C30	C38		C6	C14	C22	C30	C38	F
C7	C15	C23	C31	C39		G	C7	C15	C23	C31	C39		C7	C15	C23	C31	C39	G
C8	C16	C24	C32	C40		H	C8	C16	C24	C32	C40		C8	C16	C24	C32	C40	H
			P	90		R	6	C	11							P	91	R

C1-40							C1-40						C1-40					
7	8	9	10	11			2	3	4	5	6		7	8	9	10	11	
C1	C9	C17	C25	C33		A	C1	C9	C17	C25	C33		C1	C9	C17	C25	C33	A
C2	C10	C18	C26	C34		B	C2	C10	C18	C26	C34		C2	C10	C18	C26	C34	B
C3	C11	C19	C27	C35		C	C3	C11	C19	C27	C35		C3	C11	C19	C27	C35	C
C4	C12	C20	C28	C36		D	C4	C12	C20	C28	C36		C4	C12	C20	C28	C36	D
C5	C13	C21	C29	C37		E	C5	C13	C21	C29	C37		C5	C13	C21	C29	C37	E
C6	C14	C22	C30	C38		F	C6	C14	C22	C30	C38		C6	C14	C22	C30	C38	F
C7	C15	C23	C31	C39		G	C7	C15	C23	C31	C39		C7	C15	C23	C31	C39	G
C8	C16	C24	C32	C40		H	C8	C16	C24	C32	C40		C8	C16	C24	C32	C40	H
			P	106		R	7	C	11							P	107	R

C1-40							C1-40						C1-40					
7	8	9	10	11			2	3	4	5	6		7	8	9	10	11	
C1	C9	C17	C25	C33		A	C1	C9	C17	C25	C33		C1	C9	C17	C25	C33	A
C2	C10	C18	C26	C34		B	C2	C10	C18	C26	C34		C2	C10	C18	C26	C34	B
C3	C11	C19	C27	C35		C	C3	C11	C19	C27	C35		C3	C11	C19	C27	C35	C
C4	C12	C20	C28	C36		D	C4	C12	C20	C28	C36		C4	C12	C20	C28	C36	D
C5	C13	C21	C29	C37		E	C5	C13	C21	C29	C37		C5	C13	C21	C29	C37	E
C6	C14	C22	C30	C38		F	C6	C14	C22	C30	C38		C6	C14	C22	C30	C38	F
C7	C15	C23	C31	C39		G	C7	C15	C23	C31	C39		C7	C15	C23	C31	C39	G
C8	C16	C24	C32	C40		H	C8	C16	C24	C32	C40		C8	C16	C24	C32	C40	H
			P	122		R	8	C	11							P	123	R

C1-40					C1-40							C1-40					C1-40	
2	3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8
C1	C9	C17	C25	C33	C1	C9	C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9
C2	C10	C18	C26	C34	C2	C10	C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10
C3	C11	C19	C27	C35	C3	C11	C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11
C4	C12	C20	C28	C36	C4	C12	C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12
C5	C13	C21	C29	C37	C5	C13	C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13
C6	C14	C22	C30	C38	C6	C14	C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14
C7	C15	C23	C31	C39	C7	C15	C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15
C8	C16	C24	C32	C40	C8	C16	C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16
1	C	12						P	12		R	1	C	13				

C1-40					C1-40							C1-40					C1-40	
2	3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8
C1	C9	C17	C25	C33	C1	C9	C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9
C2	C10	C18	C26	C34	C2	C10	C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10
C3	C11	C19	C27	C35	C3	C11	C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11
C4	C12	C20	C28	C36	C4	C12	C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12
C5	C13	C21	C29	C37	C5	C13	C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13
C6	C14	C22	C30	C38	C6	C14	C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14
C7	C15	C23	C31	C39	C7	C15	C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15
C8	C16	C24	C32	C40	C8	C16	C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16
2	C	12						P	28		R	2	C	13				

C1-40					C1-40							C1-40					C1-40	
2	3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8
C1	C9	C17	C25	C33	C1	C9	C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9
C2	C10	C18	C26	C34	C2	C10	C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10
C3	C11	C19	C27	C35	C3	C11	C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11
C4	C12	C20	C28	C36	C4	C12	C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12
C5	C13	C21	C29	C37	C5	C13	C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13
C6	C14	C22	C30	C38	C6	C14	C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14
C7	C15	C23	C31	C39	C7	C15	C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15
C8	C16	C24	C32	C40	C8	C16	C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16
3	C	12						P	44		R	3	C	13				

C1-40					C1-40							C1-40					C1-40	
2	3	4	5	6	7	8	9	10	11			2	3	4	5	6	7	8
C1	C9	C17	C25	C33	C1	C9	C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9
C2	C10	C18	C26	C34	C2	C10	C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10
C3	C11	C19	C27	C35	C3	C11	C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11
C4	C12	C20	C28	C36	C4	C12	C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12
C5	C13	C21	C29	C37	C5	C13	C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13
C6	C14	C22	C30	C38	C6	C14	C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14
C7	C15	C23	C31	C39	C7	C15	C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15
C8	C16	C24	C32	C40	C8	C16	C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16
4	C	12						P	60		R	4	C	13				

C1-40					C1-40				
2	3	4	5	6	7	8	9	10	11
C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
5	C	12						P	76

	C1-40					C1-40	
	2	3	4	5	6	7	8
A	C1	C9	C17	C25	C33	C1	C9
B	C2	C10	C18	C26	C34	C2	C10
C	C3	C11	C19	C27	C35	C3	C11
D	C4	C12	C20	C28	C36	C4	C12
E	C5	C13	C21	C29	C37	C5	C13
F	C6	C14	C22	C30	C38	C6	C14
G	C7	C15	C23	C31	C39	C7	C15
H	C8	C16	C24	C32	C40	C8	C16
R	5	C	13				

C1-40					C1-40				
2	3	4	5	6	7	8	9	10	11
C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
6	C	12						P	92

	C1-40					C1-40	
	2	3	4	5	6	7	8
A	C1	C9	C17	C25	C33	C1	C9
B	C2	C10	C18	C26	C34	C2	C10
C	C3	C11	C19	C27	C35	C3	C11
D	C4	C12	C20	C28	C36	C4	C12
E	C5	C13	C21	C29	C37	C5	C13
F	C6	C14	C22	C30	C38	C6	C14
G	C7	C15	C23	C31	C39	C7	C15
H	C8	C16	C24	C32	C40	C8	C16
R	6	C	13				

C1-40					C1-40				
2	3	4	5	6	7	8	9	10	11
C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
7	C	12						P	108

	C1-40					C1-40	
	2	3	4	5	6	7	8
A	C1	C9	C17	C25	C33	C1	C9
B	C2	C10	C18	C26	C34	C2	C10
C	C3	C11	C19	C27	C35	C3	C11
D	C4	C12	C20	C28	C36	C4	C12
E	C5	C13	C21	C29	C37	C5	C13
F	C6	C14	C22	C30	C38	C6	C14
G	C7	C15	C23	C31	C39	C7	C15
H	C8	C16	C24	C32	C40	C8	C16
R	7	C	13				

C1-40					C1-40				
2	3	4	5	6	7	8	9	10	11
C1	C9	C17	C25	C33	C1	C9	C17	C25	C33
C2	C10	C18	C26	C34	C2	C10	C18	C26	C34
C3	C11	C19	C27	C35	C3	C11	C19	C27	C35
C4	C12	C20	C28	C36	C4	C12	C20	C28	C36
C5	C13	C21	C29	C37	C5	C13	C21	C29	C37
C6	C14	C22	C30	C38	C6	C14	C22	C30	C38
C7	C15	C23	C31	C39	C7	C15	C23	C31	C39
C8	C16	C24	C32	C40	C8	C16	C24	C32	C40
8	C	12						P	124

	C1-40					C1-40	
	2	3	4	5	6	7	8
A	C1	C9	C17	C25	C33	C1	C9
B	C2	C10	C18	C26	C34	C2	C10
C	C3	C11	C19	C27	C35	C3	C11
D	C4	C12	C20	C28	C36	C4	C12
E	C5	C13	C21	C29	C37	C5	C13
F	C6	C14	C22	C30	C38	C6	C14
G	C7	C15	C23	C31	C39	C7	C15
H	C8	C16	C24	C32	C40	C8	C16
R	8	C	13				

					C1-40					C1-40						C1-40	
9	10	11			2	3	4	5	6	7	8	9	10	11		2	3
C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1	C9
C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2	C10
C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3	C11
C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4	C12
C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5	C13
C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6	C14
C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7	C15
C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8	C16
	P	13		R	1	C	14						P	14	R	1	C

					C1-40					C1-40						C1-40	
9	10	11			2	3	4	5	6	7	8	9	10	11		2	3
C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1	C9
C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2	C10
C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3	C11
C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4	C12
C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5	C13
C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6	C14
C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7	C15
C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8	C16
	P	29		R	2	C	14						P	30	R	2	C

					C1-40					C1-40						C1-40	
9	10	11			2	3	4	5	6	7	8	9	10	11		2	3
C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1	C9
C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2	C10
C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3	C11
C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4	C12
C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5	C13
C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6	C14
C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7	C15
C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8	C16
	P	45		R	3	C	14						P	46	R	3	C

					C1-40					C1-40						C1-40	
9	10	11			2	3	4	5	6	7	8	9	10	11		2	3
C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1	C9
C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2	C10
C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3	C11
C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4	C12
C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5	C13
C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6	C14
C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7	C15
C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8	C16
	P	61		R	4	C	14						P	62	R	4	C

					C1-40					C1-40						C1-40	
9	10	11			2	3	4	5	6	7	8	9	10	11		2	3
C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1	C9
C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2	C10
C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3	C11
C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4	C12
C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5	C13
C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6	C14
C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7	C15
C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8	C16
	P	77		R	5	C	14						P	78	R	5	C

					C1-40					C1-40						C1-40	
9	10	11			2	3	4	5	6	7	8	9	10	11		2	3
C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1	C9
C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2	C10
C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3	C11
C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4	C12
C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5	C13
C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6	C14
C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7	C15
C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8	C16
	P	93		R	6	C	14						P	94	R	6	C

					C1-40					C1-40						C1-40	
9	10	11			2	3	4	5	6	7	8	9	10	11		2	3
C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1	C9
C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2	C10
C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3	C11
C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4	C12
C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5	C13
C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6	C14
C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7	C15
C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8	C16
	P	109		R	7	C	14						P	110	R	7	C

					C1-40					C1-40						C1-40	
9	10	11			2	3	4	5	6	7	8	9	10	11		2	3
C17	C25	C33		A	C1	C9	C17	C25	C33	C1	C9	C17	C25	C33	A	C1	C9
C18	C26	C34		B	C2	C10	C18	C26	C34	C2	C10	C18	C26	C34	B	C2	C10
C19	C27	C35		C	C3	C11	C19	C27	C35	C3	C11	C19	C27	C35	C	C3	C11
C20	C28	C36		D	C4	C12	C20	C28	C36	C4	C12	C20	C28	C36	D	C4	C12
C21	C29	C37		E	C5	C13	C21	C29	C37	C5	C13	C21	C29	C37	E	C5	C13
C22	C30	C38		F	C6	C14	C22	C30	C38	C6	C14	C22	C30	C38	F	C6	C14
C23	C31	C39		G	C7	C15	C23	C31	C39	C7	C15	C23	C31	C39	G	C7	C15
C24	C32	C40		H	C8	C16	C24	C32	C40	C8	C16	C24	C32	C40	H	C8	C16
	P	125		R	8	C	14						P	126	R	8	C

BB3

			C1-40				
4	5	6	7	8	9	10	11
C17	C25	C33	C1	C9	C17	C25	C33
C18	C26	C34	C2	C10	C18	C26	C34
C19	C27	C35	C3	C11	C19	C27	C35
C20	C28	C36	C4	C12	C20	C28	C36
C21	C29	C37	C5	C13	C21	C29	C37
C22	C30	C38	C6	C14	C22	C30	C38
C23	C31	C39	C7	C15	C23	C31	C39
C24	C32	C40	C8	C16	C24	C32	C40
15						P	15

	C1-40					C1-40			
	2	3	4	5	6	7	8	9	10
A	C1	C9	C17	C25	C33	C1	C9	C17	C25
B	C2	C10	C18	C26	C34	C2	C10	C18	C26
C	C3	C11	C19	C27	C35	C3	C11	C19	C27
D	C4	C12	C20	C28	C36	C4	C12	C20	C28
E	C5	C13	C21	C29	C37	C5	C13	C21	C29
F	C6	C14	C22	C30	C38	C6	C14	C22	C30
G	C7	C15	C23	C31	C39	C7	C15	C23	C31
H	C8	C16	C24	C32	C40	C8	C16	C24	C32
R	1	C	16						P

			C1-40				
4	5	6	7	8	9	10	11
C17	C25	C33	C1	C9	C17	C25	C33
C18	C26	C34	C2	C10	C18	C26	C34
C19	C27	C35	C3	C11	C19	C27	C35
C20	C28	C36	C4	C12	C20	C28	C36
C21	C29	C37	C5	C13	C21	C29	C37
C22	C30	C38	C6	C14	C22	C30	C38
C23	C31	C39	C7	C15	C23	C31	C39
C24	C32	C40	C8	C16	C24	C32	C40
15						P	31

	C1-40					C1-40			
	2	3	4	5	6	7	8	9	10
A	C1	C9	C17	C25	C33	C1	C9	C17	C25
B	C2	C10	C18	C26	C34	C2	C10	C18	C26
C	C3	C11	C19	C27	C35	C3	C11	C19	C27
D	C4	C12	C20	C28	C36	C4	C12	C20	C28
E	C5	C13	C21	C29	C37	C5	C13	C21	C29
F	C6	C14	C22	C30	C38	C6	C14	C22	C30
G	C7	C15	C23	C31	C39	C7	C15	C23	C31
H	C8	C16	C24	C32	C40	C8	C16	C24	C32
R	2	C	16						P

			C1-40				
4	5	6	7	8	9	10	11
C17	C25	C33	C1	C9	C17	C25	C33
C18	C26	C34	C2	C10	C18	C26	C34
C19	C27	C35	C3	C11	C19	C27	C35
C20	C28	C36	C4	C12	C20	C28	C36
C21	C29	C37	C5	C13	C21	C29	C37
C22	C30	C38	C6	C14	C22	C30	C38
C23	C31	C39	C7	C15	C23	C31	C39
C24	C32	C40	C8	C16	C24	C32	C40
15						P	47

	C1-40					C1-40			
	2	3	4	5	6	7	8	9	10
A	C1	C9	C17	C25	C33	C1	C9	C17	C25
B	C2	C10	C18	C26	C34	C2	C10	C18	C26
C	C3	C11	C19	C27	C35	C3	C11	C19	C27
D	C4	C12	C20	C28	C36	C4	C12	C20	C28
E	C5	C13	C21	C29	C37	C5	C13	C21	C29
F	C6	C14	C22	C30	C38	C6	C14	C22	C30
G	C7	C15	C23	C31	C39	C7	C15	C23	C31
H	C8	C16	C24	C32	C40	C8	C16	C24	C32
R	3	C	16						P

			C1-40				
4	5	6	7	8	9	10	11
C17	C25	C33	C1	C9	C17	C25	C33
C18	C26	C34	C2	C10	C18	C26	C34
C19	C27	C35	C3	C11	C19	C27	C35
C20	C28	C36	C4	C12	C20	C28	C36
C21	C29	C37	C5	C13	C21	C29	C37
C22	C30	C38	C6	C14	C22	C30	C38
C23	C31	C39	C7	C15	C23	C31	C39
C24	C32	C40	C8	C16	C24	C32	C40
15						P	63

	C1-40					C1-40			
	2	3	4	5	6	7	8	9	10
A	C1	C9	C17	C25	C33	C1	C9	C17	C25
B	C2	C10	C18	C26	C34	C2	C10	C18	C26
C	C3	C11	C19	C27	C35	C3	C11	C19	C27
D	C4	C12	C20	C28	C36	C4	C12	C20	C28
E	C5	C13	C21	C29	C37	C5	C13	C21	C29
F	C6	C14	C22	C30	C38	C6	C14	C22	C30
G	C7	C15	C23	C31	C39	C7	C15	C23	C31
H	C8	C16	C24	C32	C40	C8	C16	C24	C32
R	4	C	16						P

BB3

			C1-40				
4	5	6	7	8	9	10	11
C17	C25	C33	C1	C9	C17	C25	C33
C18	C26	C34	C2	C10	C18	C26	C34
C19	C27	C35	C3	C11	C19	C27	C35
C20	C28	C36	C4	C12	C20	C28	C36
C21	C29	C37	C5	C13	C21	C29	C37
C22	C30	C38	C6	C14	C22	C30	C38
C23	C31	C39	C7	C15	C23	C31	C39
C24	C32	C40	C8	C16	C24	C32	C40
15						P	79

	C1-40					C1-40			
	2	3	4	5	6	7	8	9	10
A	C1	C9	C17	C25	C33	C1	C9	C17	C25
B	C2	C10	C18	C26	C34	C2	C10	C18	C26
C	C3	C11	C19	C27	C35	C3	C11	C19	C27
D	C4	C12	C20	C28	C36	C4	C12	C20	C28
E	C5	C13	C21	C29	C37	C5	C13	C21	C29
F	C6	C14	C22	C30	C38	C6	C14	C22	C30
G	C7	C15	C23	C31	C39	C7	C15	C23	C31
H	C8	C16	C24	C32	C40	C8	C16	C24	C32
R	5	C	16						P

			C1-40				
4	5	6	7	8	9	10	11
C17	C25	C33	C1	C9	C17	C25	C33
C18	C26	C34	C2	C10	C18	C26	C34
C19	C27	C35	C3	C11	C19	C27	C35
C20	C28	C36	C4	C12	C20	C28	C36
C21	C29	C37	C5	C13	C21	C29	C37
C22	C30	C38	C6	C14	C22	C30	C38
C23	C31	C39	C7	C15	C23	C31	C39
C24	C32	C40	C8	C16	C24	C32	C40
15						P	95

	C1-40					C1-40			
	2	3	4	5	6	7	8	9	10
A	C1	C9	C17	C25	C33	C1	C9	C17	C25
B	C2	C10	C18	C26	C34	C2	C10	C18	C26
C	C3	C11	C19	C27	C35	C3	C11	C19	C27
D	C4	C12	C20	C28	C36	C4	C12	C20	C28
E	C5	C13	C21	C29	C37	C5	C13	C21	C29
F	C6	C14	C22	C30	C38	C6	C14	C22	C30
G	C7	C15	C23	C31	C39	C7	C15	C23	C31
H	C8	C16	C24	C32	C40	C8	C16	C24	C32
R	6	C	16						P

			C1-40				
4	5	6	7	8	9	10	11
C17	C25	C33	C1	C9	C17	C25	C33
C18	C26	C34	C2	C10	C18	C26	C34
C19	C27	C35	C3	C11	C19	C27	C35
C20	C28	C36	C4	C12	C20	C28	C36
C21	C29	C37	C5	C13	C21	C29	C37
C22	C30	C38	C6	C14	C22	C30	C38
C23	C31	C39	C7	C15	C23	C31	C39
C24	C32	C40	C8	C16	C24	C32	C40
15						P	111

	C1-40					C1-40			
	2	3	4	5	6	7	8	9	10
A	C1	C9	C17	C25	C33	C1	C9	C17	C25
B	C2	C10	C18	C26	C34	C2	C10	C18	C26
C	C3	C11	C19	C27	C35	C3	C11	C19	C27
D	C4	C12	C20	C28	C36	C4	C12	C20	C28
E	C5	C13	C21	C29	C37	C5	C13	C21	C29
F	C6	C14	C22	C30	C38	C6	C14	C22	C30
G	C7	C15	C23	C31	C39	C7	C15	C23	C31
H	C8	C16	C24	C32	C40	C8	C16	C24	C32
R	7	C	16						P

			C1-40				
4	5	6	7	8	9	10	11
C17	C25	C33	C1	C9	C17	C25	C33
C18	C26	C34	C2	C10	C18	C26	C34
C19	C27	C35	C3	C11	C19	C27	C35
C20	C28	C36	C4	C12	C20	C28	C36
C21	C29	C37	C5	C13	C21	C29	C37
C22	C30	C38	C6	C14	C22	C30	C38
C23	C31	C39	C7	C15	C23	C31	C39
C24	C32	C40	C8	C16	C24	C32	C40
15						P	127

	C1-40					C1-40			
	2	3	4	5	6	7	8	9	10
A	C1	C9	C17	C25	C33	C1	C9	C17	C25
B	C2	C10	C18	C26	C34	C2	C10	C18	C26
C	C3	C11	C19	C27	C35	C3	C11	C19	C27
D	C4	C12	C20	C28	C36	C4	C12	C20	C28
E	C5	C13	C21	C29	C37	C5	C13	C21	C29
F	C6	C14	C22	C30	C38	C6	C14	C22	C30
G	C7	C15	C23	C31	C39	C7	C15	C23	C31
H	C8	C16	C24	C32	C40	C8	C16	C24	C32
R	8	C	16						P

BB3

11
C33
C34
C35
C36
C37
C38
C39
C40
16
11
C33
C34
C35
C36
C37
C38
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C40
32
11
C33
C34
C35
C36
C37
C38
C39
C40
48
11
C33
C34
C35
C36
C37
C38
C39
C40
64

BB3

11
C33
C34
C35
C36
C37
C38
C39
C40
80
11
C33
C34
C35
C36
C37
C38
C39
C40
96
11
C33
C34
C35
C36
C37
C38
C39
C40
112
11
C33
C34
C35
C36
C37
C38
C39
C40
128

The Claims

What is claimed is:

1. A logically-ordered, spatially-addressable array of molecular construct compounds having a same common molecular core and at least one variable structural diversity element, wherein the compounds composing the array differ from one another by either zero or one change in a single structural diversity element.

2. The array of Claim 1, wherein each molecular construct composing the array is unique.

3. The array of Claim 1, wherein each molecular construct composing the array is the product of a solution-phase reaction.

4. The array of Claim 1 further comprising at least one sub-array, wherein the compounds composing each sub-array differ from one another by either zero or one change in a single structural diversity element.

5. The array of Claim 1, wherein each molecular construct compound is the product of a condensation reaction having at least two components, the first component comprising a first same reactive group and a different first structural diversity element and the second component comprising a second same reactive group and a second structural diversity element, said condensation reaction being carried out under conditions wherein the first and second reactive groups react to form the molecular construct compound.

6. The array of Claim 1, wherein each molecular construct compound is the product of a condensation reaction having at least three components, the first component comprising a first same reactive group and a different first

structural diversity element, the second component comprising a second same reactive group and a second structural diversity element and the third component comprising a third same reactive group and a third structural diversity element, said condensation reaction being carried out under conditions wherein the first, second and third reactive groups react to form the molecular construct compound.

7. The array of Claim 1, wherein the compounds composing the array have from 2 to 5 structural diversity elements.

8. A logically-ordered, spatially-addressable array of compounds, wherein each compound composing the array comprises a same common molecular core, a first structural diversity element and a second structural diversity element, said array comprising a first sub-array and a second sub-array, wherein the compounds composing the first sub-array each have the same first structural diversity element and the compounds composing the second sub-array each have the same second structural diversity element.

9. The array of Claim 8 wherein the compounds composing each sub-array differ from one another by either zero or one change in a single structural diversity element.

10. A method of making a logically-ordered, spatially-addressable array of compounds having a same common core structure and n variable structural diversity elements, said method comprising the steps of:

(a) providing a plurality of reaction vessels organized into n sub-arrays;

(b) adding reactants to each of the reaction vessels in a manner such that when reacted the reactants form the compounds of the array, and such that the compounds composing each sub-array differ from one another by either

zero or one change in a single structural diversity element; and

(c) reacting the contents of each reaction vessel under appropriate conditions to form the compounds of the array.

11. A method of making a combinatorial array of compounds, said method comprising the steps of:

(a) apportioning into reaction vessels that are identifiable by their spatial addresses (i) a first plurality of compounds, each compound in the first plurality comprising a same first reactive group and a different first structural diversity element such that the compounds composing the first plurality differ from one another, with one first compound per reaction vessel; and (ii) a second compound comprising a second reactive group and a second structural diversity element, with one second compound per reaction vessel; and

(b) reacting said first and second compounds under solution phase conditions wherein the first and second reactive groups react with one another by an addition reaction to form a compound, thus forming the combinatorial array of compounds.

12. The method of Claim 11 further including the step of formatting the contents of the reaction vessels into a spatially-addressable array.

13. The method of Claim 10, 11 or 12, wherein each base module compound in the array is unique.

14. A method of identifying a compound having a property of interest, said method comprising the steps of:

(a) providing an array of compounds according to any one of Claims 1-9; and

(b) identifying which compounds in the array exhibit the property of interest.

15. The method of Claim 14 wherein the compound having the property of interest is identified by screening the array against a particular target.

LOGICALLY ORDERED ARRAYS OF COMPOUNDS AND METHODS OF MAKING AND USING THE SAME

ABSTRACT

A method for constructing an array of synthetic molecular constructs, by forming a plurality of molecular constructs having a scaffold backbone of a chemical molecule comprising a linear, branched or cyclic organic compound having at least atoms of carbon, nitrogen, sulfur, phosphorus, or combinations thereof, and at least one location on the molecule capable of undergoing reaction with other molecules for attachment of at least one structural diversity element; laying out an array possessing a logical ordering of sub-arrays of the molecular constructs; providing each sub-array with molecular constructs having the scaffold backbone and at least one structural diversity element which is different from the others; and relating each sub-array within the array to all other sub arrays by the difference in the structural diversity elements.

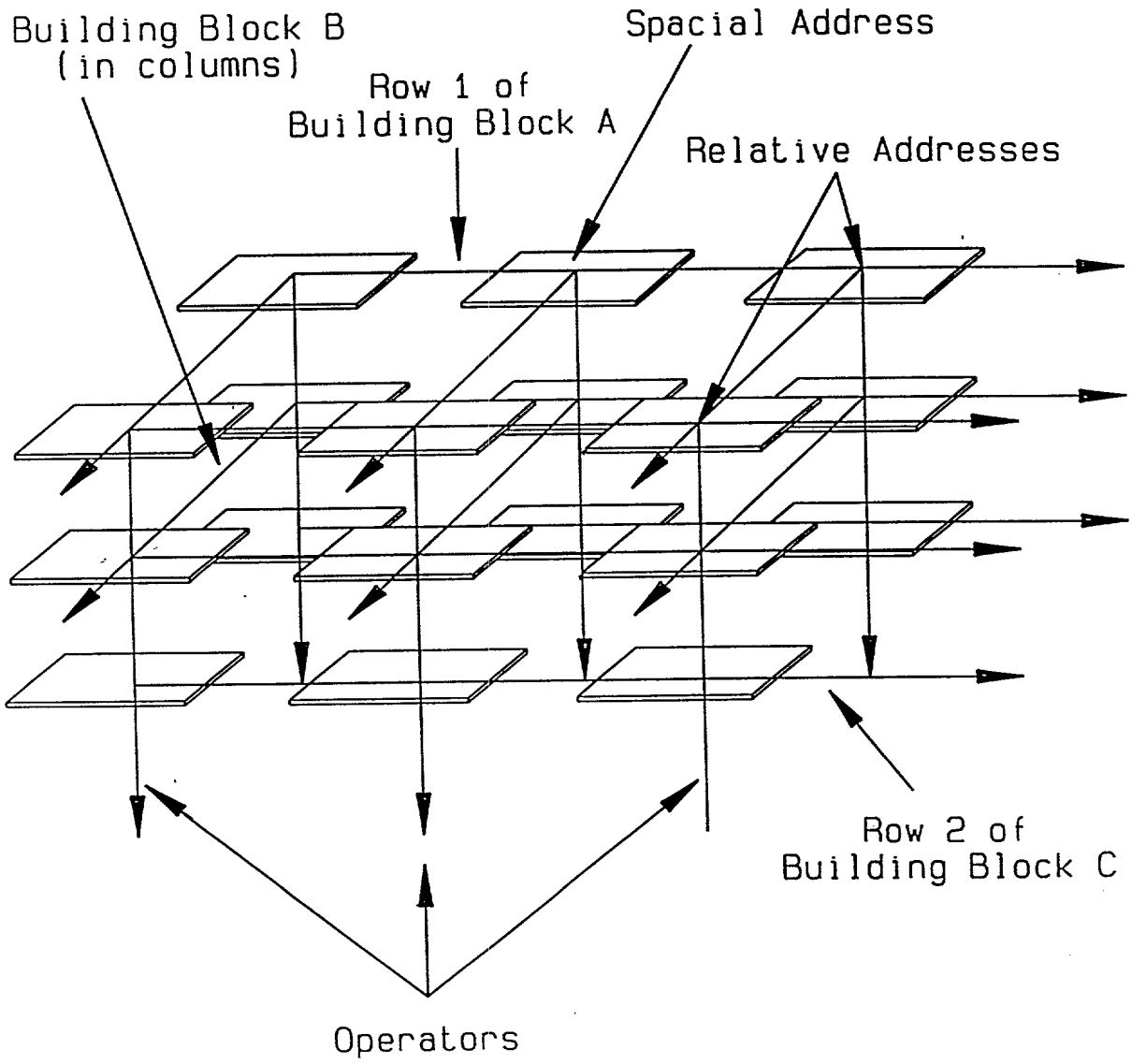
Building Block B
(in columns)
Row 1 of
Building Block A
Spacial Address
Relative Addresses
Row 2 of
Building Block C
Operators

FIG. 1

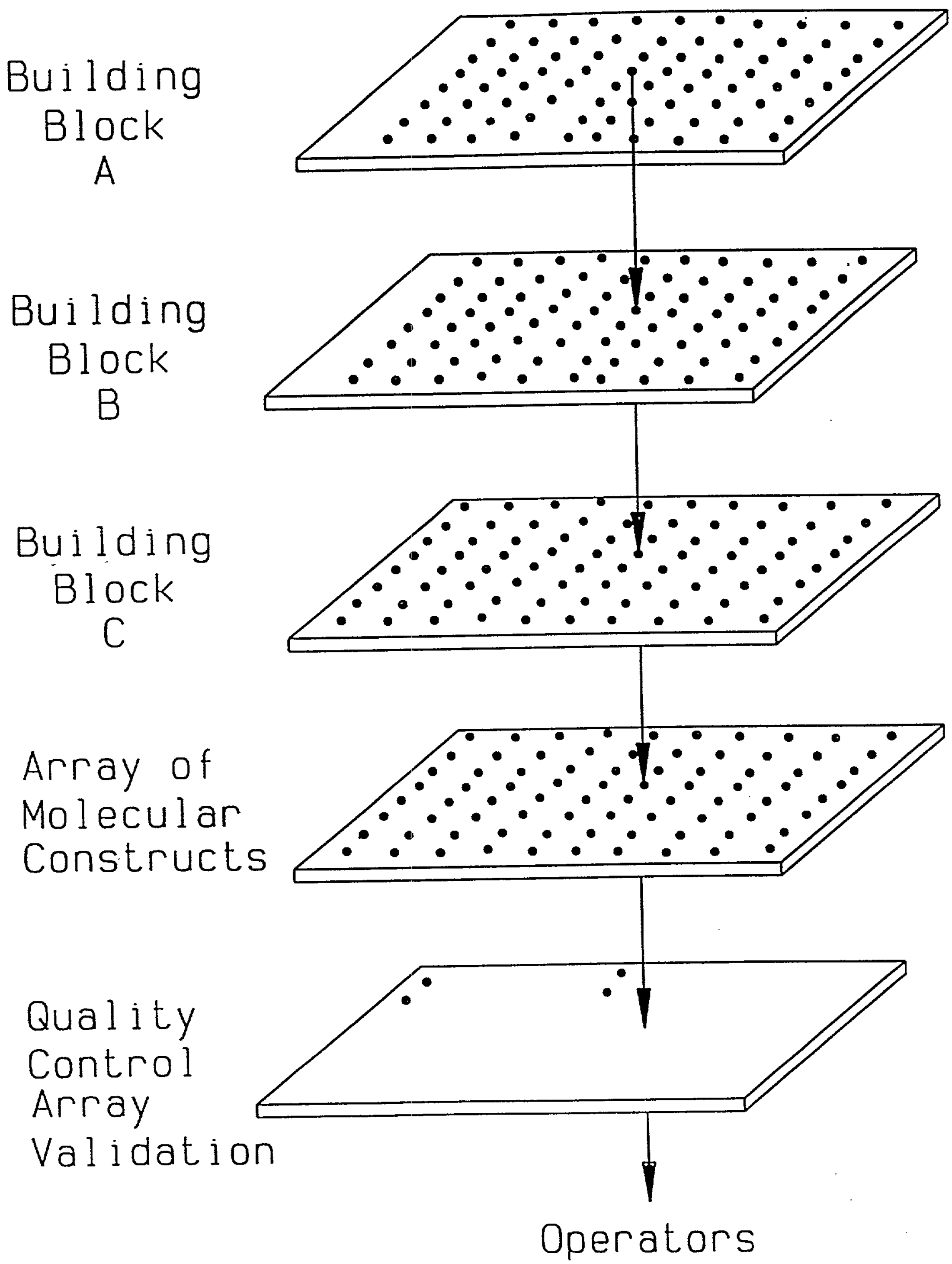
Building Block A
Building Block B
Building Block C
Array of Molecular Constructs
Quality Control Array Validation
Operators

FIG. 2

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:

R. Zambias et al.

Serial No.: 08/375,838

Filed: January 10, 1995

For: A METHOD OF GENERATING A PLURALITY OF CHEMICAL COMPOUNDS IN A SPATIALLY ARRANGED ARRAY

Group Art Unit: To be assigned

Examiner: To be assigned

Attorney Docket No.: 5925-022

PETITION UNDER 37 C.F.R. §1.47(a)

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

Pursuant to 37 C.F.R. §1.147(a), the following named joint inventors of the above-identified invention, Robert Zambias, David A. Bolten, Joseph C. Hogan, David Casebier and Cheng Tu hereby petition for entry of the Declaration and Power of Attorney executed by the above-named joint inventors on behalf of themselves and Mr. Paul Furth, a named joint inventor who has refused to execute the Declaration and Power of Attorney for the present invention.

In support of this Petition and pursuant to 37 C.F.R. §1.147(a), Applicants submit herewith a Declaration by the Applicants' representative, Allan A. Fanucci, detailing

the proofs that Mr. Furth refused to execute the Declaration and Power of Attorney.

It is believed that a fee of $130.00 is due under 37 C.F.R. §1.17(h) for submission of this Petition. Accordingly, please charge the requisite fee to Pennie & Edmonds Deposit Account No. 16-1150.

Respectfully submitted,

Date 5/30/95

Allan A. Fanucci 30,256
Allan A. Fanucci (Reg. No.)

PENNIE & EDMONDS
1155 Avenue of the Americas
New York, New York 10036-2711

(212) 790-9090

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below at 201 et seq. underneath my name.

I believe I am the original, first and sole inventor if only one name is listed at 201 below, or an original, first and joint inventor if plural names are listed at 201 et seq. below, of the subject matter which is claimed and for which a patent is sought on the invention entitled

A METHOD OF GENERATING A PLURALITY OF CHEMICAL COMPOUNDS IN A SPATIALLY ARRANGED ARRAY

the specification of which:

☒ is attached hereto
☒ was filed in the United States on January 20, 1995 as Application Serial No. 08/375,838
with a Preliminary Amendment filed on January 20, 1995. *(if applicable)*

☐ was filed as PCT international application Serial No. _____ on _____ and was amended under PCT Article 19 on _____ *(if applicable)*

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119/§172 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

EARLIEST FOREIGN APPLICATION(S), IF ANY, FILED PRIOR TO THE FILING DATE OF THE APPLICATION			
APPLICATION NUMBER	COUNTRY	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 U.S.C. 119/172
			YES ☐ NO ☐
			YES ☐ NO ☐
			YES ☐ NO ☐
			YES ☐ NO ☐

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

APPLICATION SERIAL NO.	FILING DATE	STATUS		
		PATENTED	PENDING	ABANDONED

POWER OF ATTORNEY: As a named inventor, I hereby appoint S. Leslie Misrock (Reg. No. 18872), Harry C. Jones, III (Reg. No. 20280), Berj A. Terzian (Reg. No. 20060), Gerald J. Flintoft (Reg. No. 20823), David Weild, III (Reg. No. 21094), Jonathan A. Marshall (Reg. No. 24614), Barry D. Rein (Reg. No. 22411), Stanton T. Lawrence, III (Reg. No. 25736), Isaac Jarkovsky (Reg. No. 22713), Joseph V. Colaianni (Reg. No. 20019), Charles E. McKenney (Reg. No. 22795), Philip T. Shannon (Reg. No. 24278), Francis E. Morris (Reg. No. 24615), Charles E. Miller (Reg. No. 24576), Gidon D. Stern (Reg. No. 27469), John J. Lauter, Jr. (Reg. No. 27814), Brian M. Poissant (Reg. No. 28462), Brian D. Coggio (Reg. No. 27624), Rory J. Radding (Reg. No. 28749), Stephen J. Harbulak (Reg. No. 29166), Donald J. Goodell (Reg. No. 19766), James N. Palik (Reg. No. 25510), Thomas E. Friebel (Reg. No. 29258), Laura A. Coruzzi (Reg. No. 30742), Jennifer Gordon (Reg. No. 30753), Jon R. Stark (Reg. No. 30111), Allan A. Fanucci (Reg. No. 30256), Geraldine F. Baldwin (Reg. No. 31232), Victor N. Balancia (Reg. No. 31231), Albert P. Halluin (Reg. No. 25227), and Marcia H. Sundeen (Reg. No. 30893), whose address is Pennie & Edmonds, 1155 Avenue of the Americas, New York, New York 10036, and each of them, my attorneys, to prosecute this application, and to transact all business in the Patent and Trademark Office connected therewith.

PENNIE & EDMONDS DOCKET NO. 5925-022

SEND CORRESPONDENCE TO:	PENNIE & EDMONDS 1155 AVENUE OF THE AMERICAS NEW YORK, N.Y. 10036-2711	DIRECT TELEPHONE CALLS TO: PENNIE & EDMONDS (212) 790-9090

201	FULL NAME OF INVENTOR	LAST NAME Zambias	FIRST NAME Robert	MIDDLE NAME	
	RESIDENCE & CITIZENSHIP	CITY Lexington	STATE OR FOREIGN COUNTRY Massachusetts	COUNTRY OF CITIZENSHIP U.S.A.	
	POST OFFICE ADDRESS	STREET 1308 Massachusetts Avenue	CITY Lexington	STATE OR COUNTRY Massachusetts	ZIP CODE 02173
202	FULL NAME OF INVENTOR	LAST NAME Bolten	FIRST NAME David	MIDDLE NAME A.	
	RESIDENCE & CITIZENSHIP	CITY Tinton Falls	STATE OR FOREIGN COUNTRY New Jersey	COUNTRY OF CITIZENSHIP U.S.A.	
	POST OFFICE ADDRESS	STREET 146 Hope Road	CITY Tinton Falls	STATE OR COUNTRY New Jersey	ZIP CODE 07724
203	FULL NAME OF INVENTOR	LAST NAME Hogan	FIRST NAME Joseph	MIDDLE NAME C.	
	RESIDENCE & CITIZENSHIP	CITY Belmont	STATE OR FOREIGN COUNTRY Massachusetts	COUNTRY OF CITIZENSHIP U.S.A.	
	POST OFFICE ADDRESS	STREET 50 Oak Avenue	CITY Belmont	STATE OR COUNTRY Massachusetts	ZIP CODE 02178
204	FULL NAME OF INVENTOR	LAST NAME Furth	FIRST NAME Paul	MIDDLE NAME	
	RESIDENCE & CITIZENSHIP	CITY Waltham	STATE OR FOREIGN COUNTRY Massachusetts	COUNTRY OF CITIZENSHIP U.S.A.	
	POST OFFICE ADDRESS	STREET 310 College Farm Road, Apt. 13	CITY Waltham	STATE OR COUNTRY Massachusetts	ZIP CODE 01749
205	FULL NAME OF INVENTOR	LAST NAME Casebier	FIRST NAME David	MIDDLE NAME	
	RESIDENCE & CITIZENSHIP	CITY Hudson	STATE OR FOREIGN COUNTRY Massachusetts	COUNTRY OF CITIZENSHIP U.S.A.	
	POST OFFICE ADDRESS	STREET 45 Priest Street	CITY Hudson	STATE OR COUNTRY Massachusetts	ZIP CODE 01749
206	FULL NAME OF INVENTOR	LAST NAME Tu	FIRST NAME Cheng	MIDDLE NAME	
	RESIDENCE & CITIZENSHIP	CITY Cambridge	STATE OR FOREIGN COUNTRY Massachusetts	COUNTRY OF CITIZENSHIP U.S.A.	
	POST OFFICE ADDRESS	STREET 305 Memorial Drive	CITY Cambridge	STATE OR COUNTRY Massachusetts	ZIP CODE 02139

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201	SIGNATURE OF INVENTOR 202	SIGNATURE OF INVENTOR 203
Robert A. Zambias	David A. Bolten	Joseph C. Hogan
DATE 3/20/95	DATE 3/28/95	DATE 03-20-95
SIGNATURE OF INVENTOR 204	SIGNATURE OF INVENTOR 205	SIGNATURE OF INVENTOR 206
	David L. Casebier	Cheng Tu
DATE	DATE 3/20/95	DATE 3/20/95

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:

R. Zambias et al.

Serial No.: 08/375,838

Filed: January 10, 1995

For: A METHOD OF GENERATING A PLURALITY OF CHEMICAL COMPOUNDS IN A SPATIALLY ARRANGED ARRAY

Group Art Unit: To be assigned

Examiner: To be assigned

Attorney Docket No.: 5925-022

DECLARATION IN SUPPORT OF FILING ON BEHALF OF OMITTED INVENTOR UNDER 37 C.F.R. §1.47(a)

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

I, Allan A. Fanucci, a representative of the Applicants and appointed Power of Attorney by the Declaration and Power of Attorney filed concurrently with this Declaration in the above-identified application, hereby declare that:

1. This declaration is made as to the facts which are relied upon to establish the diligent efforts made to secure the execution of the Declaration and Power of Attorney by inventor Paul Furth, for the above-identified application both before and after deposit thereof in the United States Patent and Trademark Office.

2. This declaration is being made on facts of which I have first hand knowledge.

3. Paul Furth is one of the named inventors of the above-identified application.

4. The last known address of Paul Furth is 59 Bowdoin Street, Medford, Massachusetts, 02155.

5. By me or under my direction and control, several *bona fide* attempts were made to present a copy of the application papers for the above-identified invention (a specification including the claims, Declaration and Power of Attorney, and assignment) to Mr. Furth for his signature.

6. On March 28, 1995, a letter addressed to Paul Furth, 310 College Farm Road, Apt. 13, Waltham, Massachusetts 01749, transmitting a Declaration and Power of Attorney, as well as an Assignment was forwarded via Federal Express to Mr. Furth (Attached as Exhibit A). The March 28 letter references earlier occasions where Mr. Furth was provided with copies of the application papers and again requests that Mr. Furth review and execute these documents.

7. In response to the March 28th letter, I telephoned Mr. Furth and was informed that he had moved to a new address. Upon my request, Mr. Furth visited ArQule's offices on or about April 12, 1995 and retrieved copies of the application papers for this case.

8. On April 13, 1995, after Mr. Furth retrieved the application papers, I telephoned him to discuss execution of the documents. I was informed that he would return the executed documents by April 28, 1995. The executed documents were not returned by that date.

9. In a subsequent telephone conference on or about May 15, 1995, I was informed that Mr. Furth changed his mind and would not sign the Declaration and Power of Attorney nor the Assignment. I was not informed as to the reason why Mr. Furth now refused to execute the application papers. I was further informed that any additional inquiries regarding this subject should be made through Mr. Furth's attorney.

10. Based on the foregoing, I have concluded that Mr. Furth's conduct constitutes a refusal to execute the Declaration and Power of Attorney, as well as the Assignment

for the above-identified application, which were provided to him and which resulted from his work in the employ of the assignee, ArQule, Inc.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. §1001, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date 5/30/95

Allan A. Fanucci 30,256
Allan A. Fanucci (Reg. No.)

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